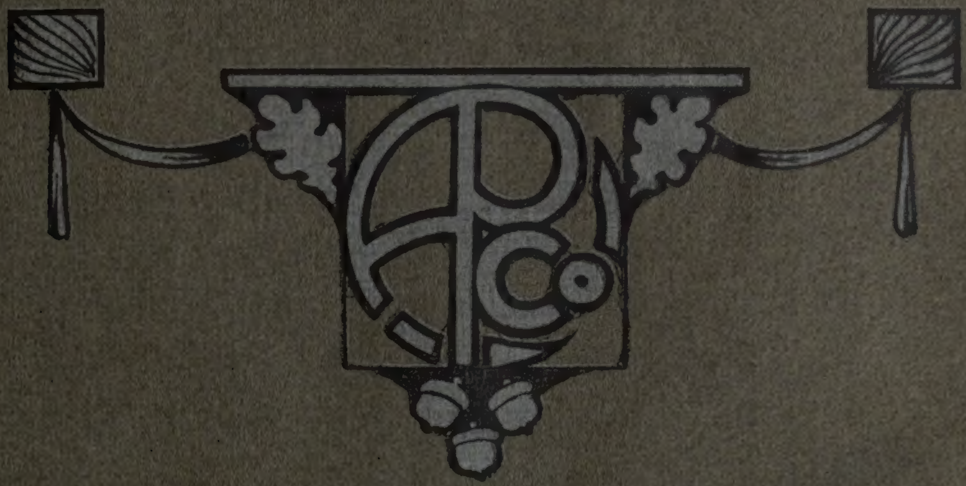
MARCH 15th TORONTO 1911

LIBRARY
MAY 1911
UNIVERSITY OF TORONTO

SPS

THE BUILDER AND CONTRACTOR



THE
ACTON PUBLISHING CO., LTD.
TORONTO. MONTREAL.

Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

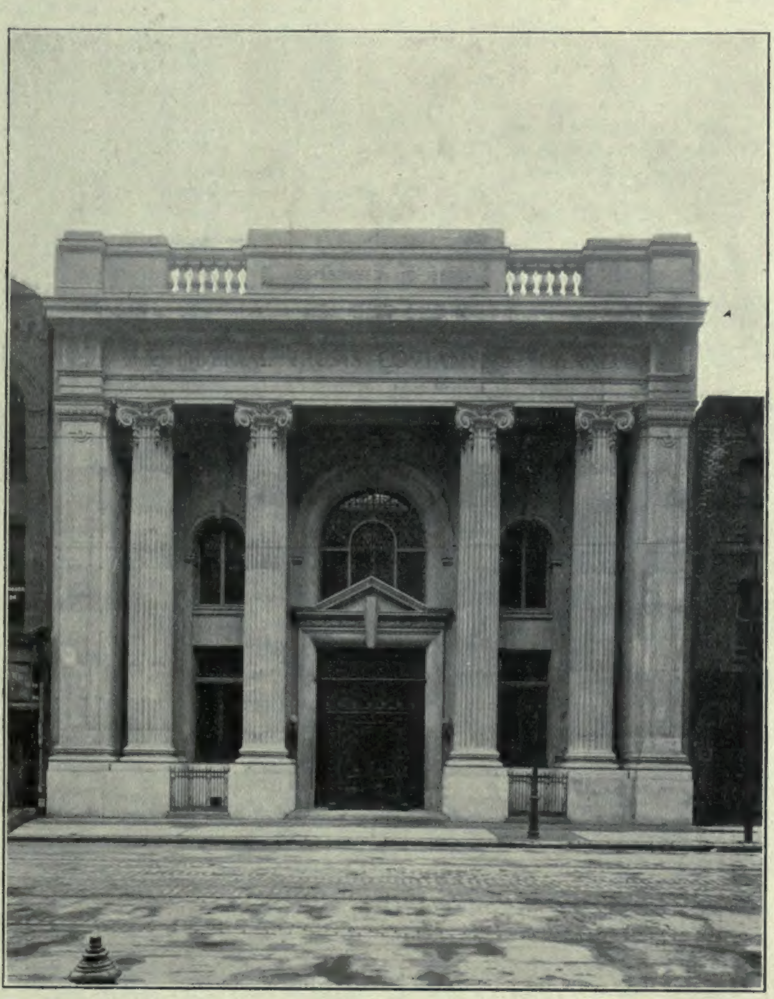
http://www.archive.org/details/buildercontracto12torouoft

Roman Stone

(Trade Mark Registered)

Roman Stone has established itself as a standard product in Canada in the last decade.

The leading architects have specified it wherever stone can be used.



Imperial Trust Building, Toronto

In the construction and decoration of

Bank Buildings
Office Buildings
Apartment Houses

Also for

Stone Trimmings in all classes of moderate and high priced residences.

BECAUSE

It is made from the best and purest materials.

It requires no waterproofing.

It is uniform in quality and composition—no facing material being used.

It is made by the oldest established firm in the largest and best equipped plant in the Dominion.

Architects who insist on the best always specify
Builders who require the best always order **ROMAN STONE**

The Roman Stone Company Limited

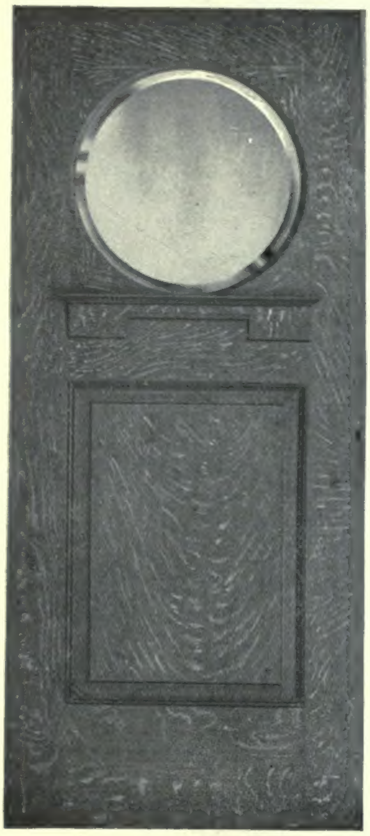
Head Office: 504-5 Temple Building, TORONTO

Agents Montreal, Que.
T. A. MORRISON & CO., 204 St. James St.

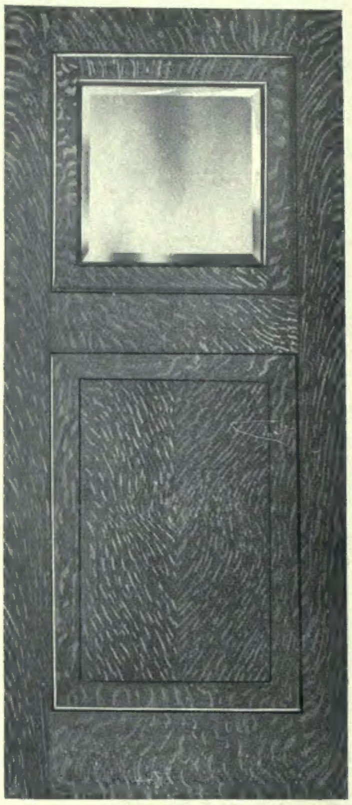
Factory:
WESTON, ONTARIO

Agents Winnipeg, Man.
S. L. BEDSON, Canada Life Building

WHOLESALE AND RETAIL



DOORS



TRIM

LUMBER FRAMES LATH

SHINGLES

We have on hand at all times a large stock of Six Cross Panel Doors and can make shipments immediately. We are also in a position to get out Veneered Doors on short notice. ∴ ∴

WE STOCK WHITE, RED, GEORGIA PINE AND HARDWOOD TRIM.

WRITE FOR CATALOGUE AND PRICES. **PROMPT SHIPMENTS.**

L. A. DeLAPLANTE LIMITED

TORONTO

HEAD OFFICE : 24 King St. West.
Room 11, Manning Arcade.
Phone Main 5912-5913.

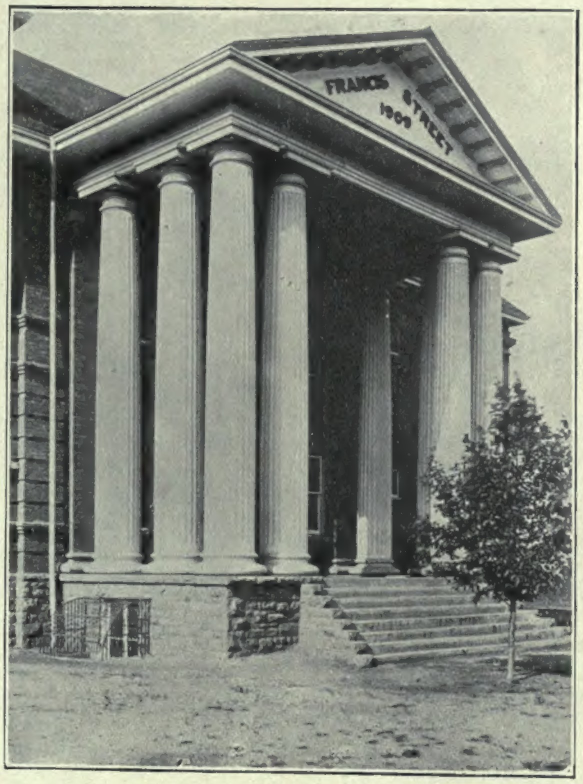
FACTORY : 208 Main Street, East
Toronto.
Phone Beach 230-231.

BATTS

LIMITED

The place to buy Staved Columns, Pine and Veneered Doors, Sash, Newel Posts, Trim and Cypress Greenhouse material.

Column Style B. L. No. 4



Francis Street Public School, Fort William

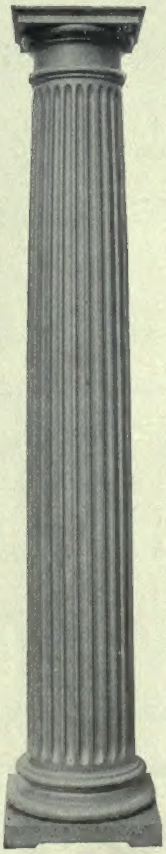
The above Fluted Columns, which are 36 inches in diameter at base of shaft and 26 feet long were manufactured by us.

Our column department, which contains 10,000 square feet of floor space, is equipped throughout with special machinery mostly of our own design. We have appliances to make plain or fluted columns up to 48 inches in diameter and 40 feet long.

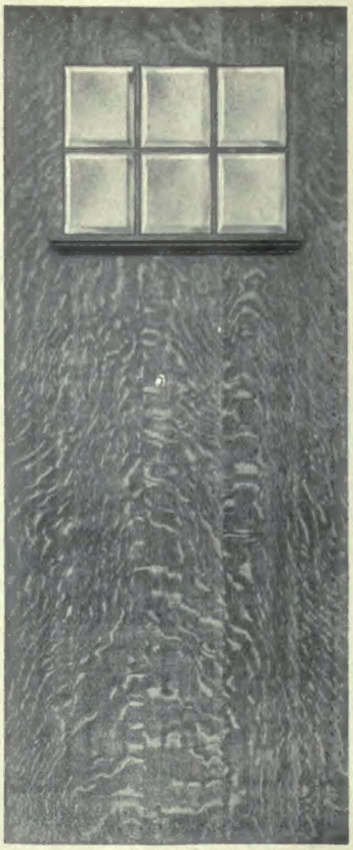
Send for Illustrated Catalogue

Batts Limited

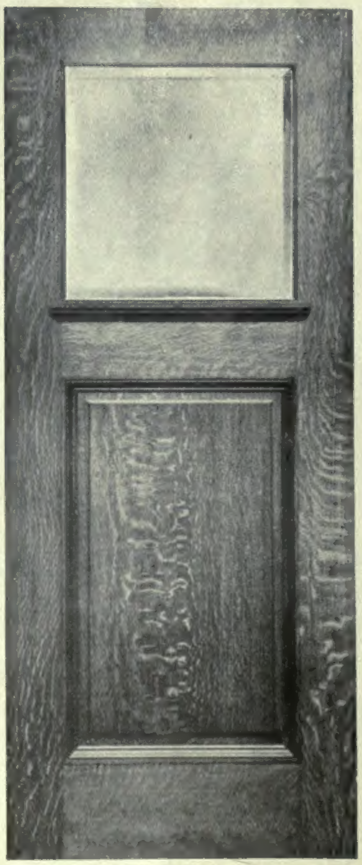
374 Pacific Ave. - West Toronto



Column Style B. L. No. 3



Door Style No. B. L. 310



Door Style No. B. L. 312

STEEL AND RAD

"Steelcrete" Expanded Metal

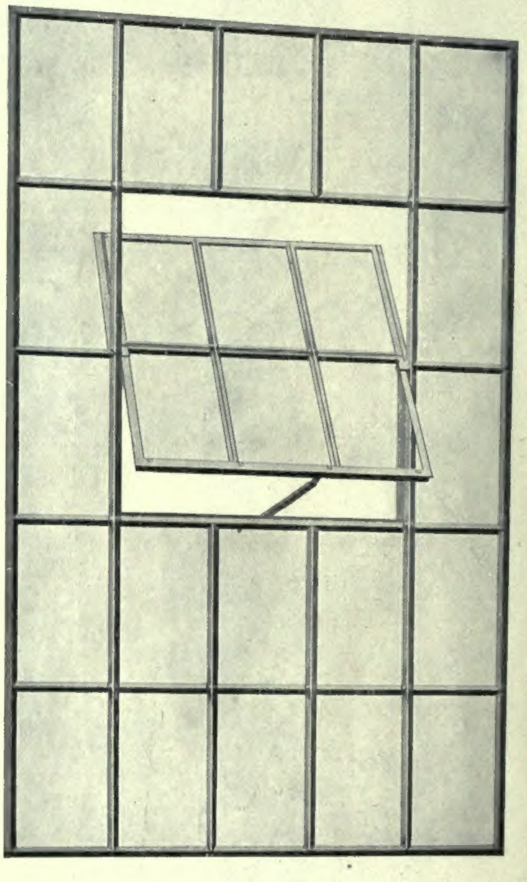
Twenty Years Ago the Best—the Best To-Day

Concrete Reinforcement

Plasterers' Lath, Studding, Furring, Corner Bead, Etc.

We are the Leaders in these lines. Our goods are the standard. Get our Proposition before Purchasing.

"Fenestra" Solid Steel Sash and Casements



will secure the greatest possible amount of Daylight and Fresh Air for the interior of Your Building.

They are Light, Strong and Durable, Absolutely Weather Proof and Fire Proof.

If you really want the Best for the Money you must investigate "Fenestra" Sash. See them—at our Show Rooms in Toronto or Montreal—at our Agencies—But see them. **Catalog F-2 is the one.**

Head Office: Fraser Avenue, Toronto

Show Rooms: 92 King Street West, 80 Adelaide Street East, Toronto;
138 Craig Street West,
Montreal.

SPECIFY AND USE STEEL AND

IATION LIMITED

"KING" Boilers and "KING" Radiators

"KING" HIGH BASE BOILER

In this **New Boiler** we set ourselves the highest possible standard, with the result that the completed Boiler has more than fulfilled our expectations.

The special design of the Combustion chambers and water ways guarantee the maximum heat for the minimum fuel consumption.

We wish to draw special attention to the operation of the grates which is entirely new in the construction of shaking apparatus and is a decided improvement over all others.

These are only a few of the many special features peculiar to "KING" Boilers.

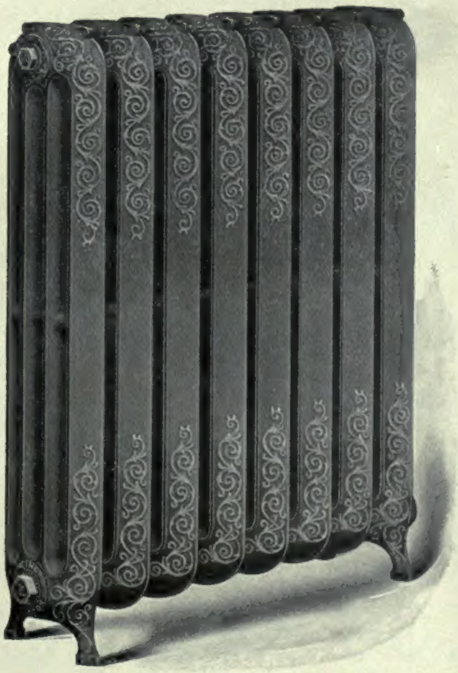
Call at our Show Rooms and let us explain them to you.

This radiator is well and favorably known for the excellence of its materials and construction, the sections being joined together with malleable screw nipples.

We guarantee every Radiator that leaves our works, not only against defect or leakage, but also that they contain the full amount of Heating Surface Catalogued.

"KING" Radiators are made in artistic styles of both plain and ornamental design, which are readily adapted to interior decorative schemes.

See them at our Show Rooms.



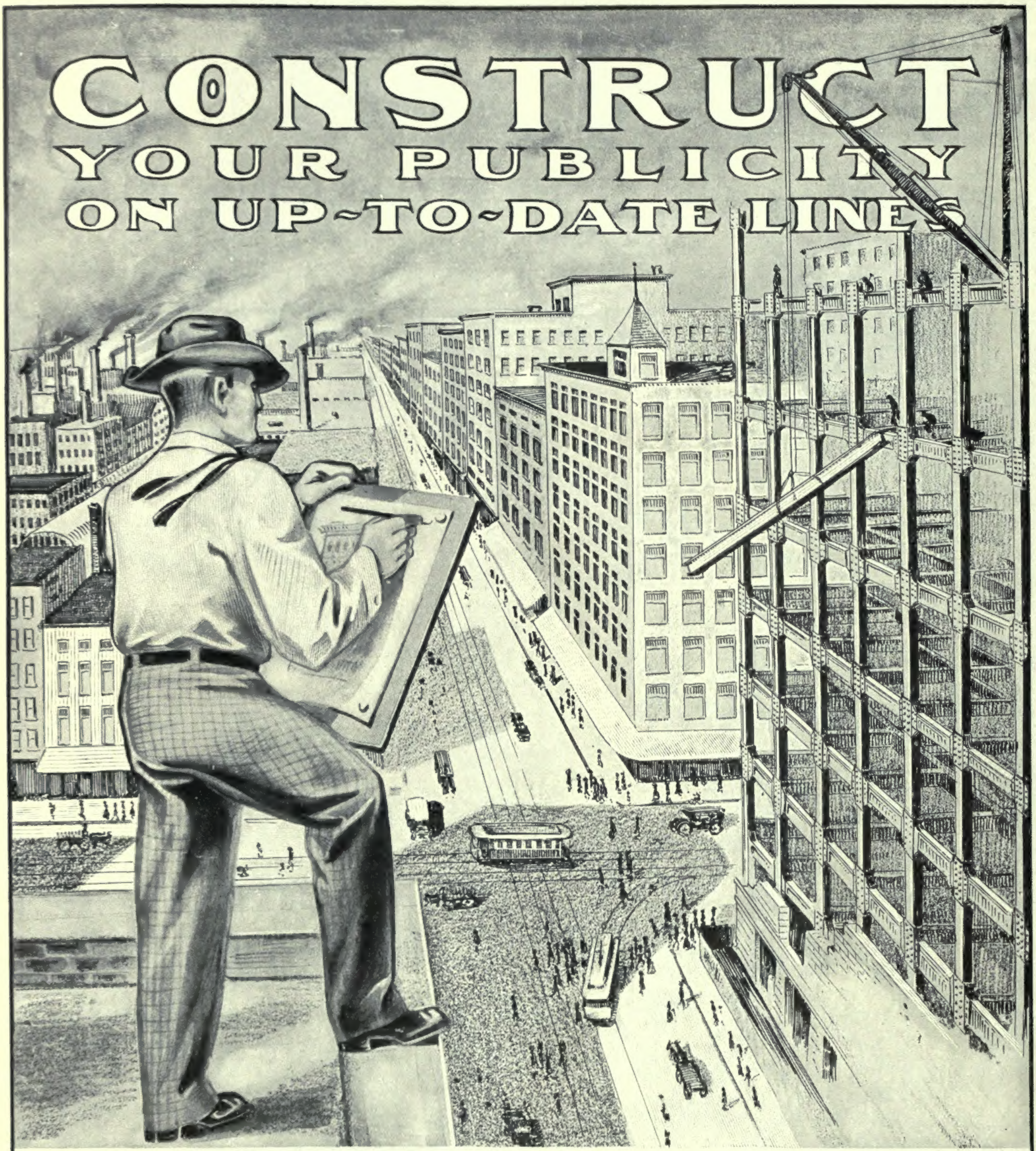
4 COLUMN "KING" RADIATOR

Make sure of having "KING" Boilers and "KING" Radiators specified.

We invite your inspection at our Show Rooms.

RADIATION PRODUCTS

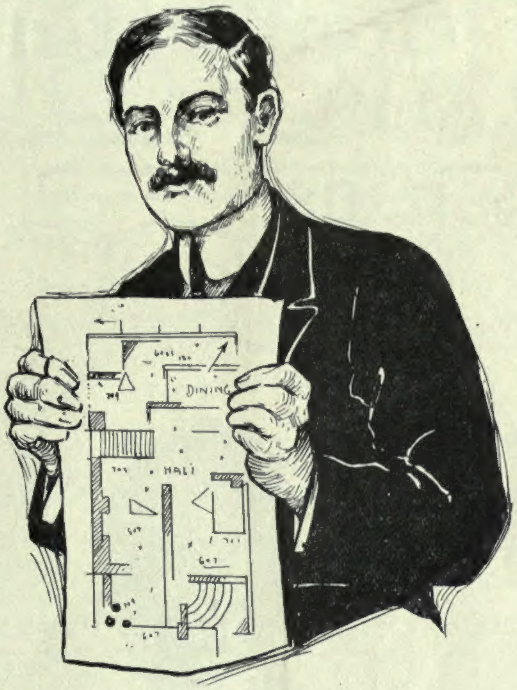
Agencies and Stock in all the leading Canadian Cities



LEGG BROS. ENGRAVING CO.

ARE BUILDERS OF SUCCESSFUL
ADVERTISING LITERATURE BY
ILLUSTRATING & ENGRAVING
CONSULT US BEFORE PLANNING YOUR NEXT
CATALOG BOOKLETS OR MAGAZINE ENGRAVING

5 JORDAN ST. TORONTO, CANADA.



ARCHITECTS and BUILDERS

The building season is now on.

Do not expose your valuable tracings to the weather.

A shower of rain will greatly damage them.

Our blue print department is the best equipped in Canada. No order is too big for us to handle and none too small to receive the most careful consideration

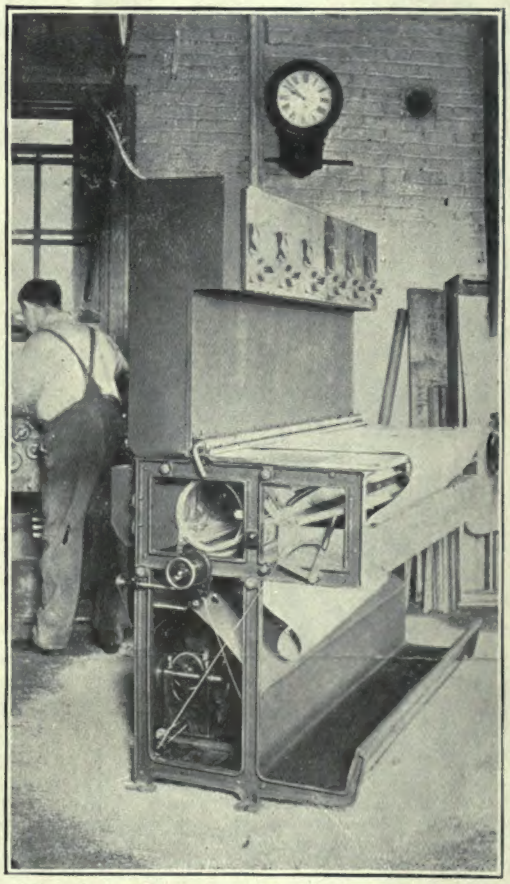
PRICES ON APPLICATION

We carry a full line of Architects' and Builders'

LEVELS and TRANSITS

of the most approved patterns at the lowest cost

SEND FOR CATALOGUE



This is the most complete blue print machine in Canada
Its capacity is 6000 square feet per hour.

The Art Metropole Limited

149 Yonge Street, Toronto, Ontario

The Builder and Contractor
Subscription Staff
Covers All Canada

These are some of the men who are now gathering subscriptions and news for us in various parts of Canada. They will call on you several times during the coming year.

The Builder and Contractor
is built to help YOU

It is Canada's National
- Building Paper -

C. H. MOODY

Moody wanders over British Columbia and Alberta with copies of The Builder and Contractor in his back pocket. He is known by the deep Scotch voice that comes so strange from one so small.

F. J. TYNER

Tyner pays particular attention to that self-important town Toronto and those east of it to Kingston.

G. A. TALBOT

The fair-haired boy sends us all the news he can find in Ontario west of Toronto. Talbot impresses many of those in this territory with the fact that they couldn't be happy without The Builder and Contractor.

H. KAVANAGH

You don't have to look twice to know he's Irish. Kavanagh is much impressed with the importance of the province of Quebec, where he spends most of his time. He only goes as far west as Kingston.

These men are gathering news and the markets for us all over the Dominion. If you think our Journal is too local tell them so.

F. PANG

He is now down by the sea covering the Maritime Provinces for The Builder and Contractor. His circulation reports show that we have made a hit in the East.

There are now 8 men directly interested in increasing The Builder and Contractor circulation and influence. Of course, our Editorial and Advertising Staffs in Montreal and Toronto have subscription pads also.

The Builder and Contractor Subscription: $1.50 a year

THE BUILDER AND CONTRACTOR

Vol. 1, No. 2. **Toronto, March 15, 1911.** **$1.50 Per Year.**

ACTON PUBLISHING CO.
LIMITED
OFFICE OF PUBLICATION
59-61 JOHN STREET - TORONTO
Eastern Office, Coristine Building, Montreal
Chicago Office, 4075 Perry St., Chicago, Ill.

A Journal Devoted to the Interests of the
BUILDERS OF HOMES
PUBLISHED ON 1st AND 15th OF EACH MONTH
For Contents See Page 35

C. S. ACTON - - PRESIDENT
K. A. MACKENZIE, B.A.Sc., MAN. EDITOR
A. E. UREN - - ASSOC. EDITOR

The Vacant Lot and Single Tax

Mr. Joseph Fels, an American multi-millionaire, and a single tax apostle, has no use for vacant lots. He has recently completed a tour of Canada and at Vancouver made the statement that there were too many empty lots in the cities, and too much vacant land in Canada. While these vacant spaces existed, he said, there should never be any talk of poverty, as the people had the means of securing a livelihood right before their eyes. Because the land taxes were light nothing was done in the way of improvement, although at the time the properties received an undeserved increase in value through proximity to other land which was being improved.

Mr. Fels told of his work in establishing little villages in England, and he had found he remarked, that the result was that the land values were sent up at least 70 per cent. for three miles around any of these small communities. He claimed credit for a share in the recent budget in England, which he thought would work out well for the country, in that it produced a higher tax on land, and a lower one on imports. The visitor also told of his single tax work in America, explaining at the same time although his address was Philadelphia, he spent more than half of each year across the Atlantic, and his efforts were mainly directed to influencing the British public towards the adoption of the single tax system, and others of the doctrines of the late Henry George.

"I would take steps to abolish municipal licenses, then the provincial ones and finally those of the federal government, as well as the tax on buildings," said he last night. "This would mean for one thing that the hotels would not be paying licenses. If they are legal they should not be taxed. If they are not legal they ought to be put out of business. Then again I would do away with the customs duties."

He was asked if this would not mean in such a young country as Canada the admission of American and other foreign products at prices which would force the extinction of the home industries, but he answered that the impetus given to business on this side of the line by the destruction of the multifarious taxes of the present time would be more than enough to support the industries of Canada. He went on to say that within the past year Great Britain, through its change of policy in this respect, had secured more trade than ever before and that it would soon "eat America up."

He was asked if the burden of taxation created by the removal of the tax on buildings would not naturally fall on the residential parts of the city as composing the greater amount of the land within the city limits. This would mean that properties which were not revenue-producing would have to pay to a very large extent for the removal of the tax on those buildings which were revenue producing. To this question Mr. Fels said that in his opinion the labor of man should not be taxed, no matter what form that labor took. The value of land was created by the presence of a community and the land should be made to pay for the benefit received. The person who was energetic enough to build a big block or establish a plant should not have to pay for his energy.

The step taken by the City Council of Vancouver in abolishing the tax on buildings was one in the right direction, thought Mr. Fels, and while it was not single tax in itself, it was on the way. In proper succession the next thing to do would be to take off all the municipal licenses and fees and make the land pay for the expenses of government. Provincial and federal duties could follow on the road to extinction.

Comparisons on Canadian and American Building Statistics

In view of the proposed trade pact between Canada and the United States, it is interesting to note the business conditions within the two countries as indicated in the building returns for last year. While there has been almost a phenomenal increase throughout all Canada, United States has barely held its own . Many districts report a serious falling off. This will probably explain one of the reasons why Uncle Sam, so long disdainful of our trade, is now so anxious to complete negotiations for a more favorable entry into the Canadian markets.

Canadian building operations show gratifying increases over previous years as compared with building in the United States. Last year exceptional activity was displayed in Canada. In nearly every large centre more building was carried on than during 1909, the construction of small houses and residences being a feature. The figures of 22 Canadian cities are included in the following compilation. It will be seen that the expenditure by these municipalities in 1910 amounted to $67,398,650, as against $42,008,876 in 1909. This is an increase of 60.4 per cent. and shows a remarkable gain of 150.5 per cent. as compared with 1908.

Total, 22 cities. $67,398,650 $42,008,876 *60.4 $26,908,508

	1910.	1909.	*Inc. or Dec.*
Montreal	$15,815,859	$7,785,621	*100.6
Winnipeg	15,106,450	9,226,825	*63.7
Calgary	5,589,594	2,420,452	*131.0
Regina	2,351,288	744,479	*215.9
Vancouver	13,150,365	7,258,505	*95.0
Victoria	2,196,095	1,673,420	*31.3
Edmonton	2.159,106	2,128,166	*1.4
Lethbridge	1,210,810	1,268,615	†4.6
Moose Jaw	1,035,290	1,107,500	†4.5
Fernie	325,000	1,374,700	†76.3
Fort William	2,381,125	2,970,365	†19.8
Other 11 cities	6,077,668	4,050,228	*50.0
Total, 22 cities	$67,398,650	$42,008,876	*60.4

There was unusual activity in building construction in the United States in 1909 and perhaps unnaturally a decline occurred in many sections of that country last year. Two years ago there was much building of a speculative or anticipatory nature and this particular line decreased last year. The *New York Chronicle* thinks that while preparing for a demand that is expected to arise seems justifiable no such excuse would appear to cover recent operations in outlying portions of Greater New York. In Brooklyn, for example, there has apparently been over-building in certain sections and the result is seen in the number of dwellings that await occupants. Our contemporary gives the following statistics respecting building in the neighboring Republic:

	1910.	1909.	*Inc. or Dec.*
New York City—	$	$	%
Manhattan	108,643,095	144,332,212	†24.7
Other Boroughs	99,433,937	123,682,969	†19.6
Total	208,077,032	268,015,181	†22.4
Portland, Me.	1, 438,595	3,000,000	†50.4
Manchester, N. H.	1,321,980	1,797,518	†26.5
Boston	16,061,365	14,078,646	*14.1
Mass. other 21 cities	41,589,520	42,387,846	†1.9
Hartford	4.541,979	3,440,925	*32.0
New Haven	4,386,065	4,226,322	*3.8
Conn. other 6 cities	7,279,430	10,241,520	†28.9
Rhode Island, 3 cities	6,350,725	6,388,850	†7.1
Rochester	10,082,528	9,272,132	*8.7
Buffalo	9,232,000	10,077,365	†8.4
N. Y. State other 10 cities	17,753,081	17,479,150	*1.6
Newark	13,394,812	14,177,159	†5.5
N. J. other 12 cities	20,593,160	23,722,317	†13.2
Philadelphia	37,874,230	42,881,370	†11.7
Pittsburgh	13,656,213	16,549,526	†17.5
Penn. other 13 cities	14,012,668	17,014,632	†17.6
Wilmington, Del.	2,024,092	1,968,257	*2.8
Baltimore	9,384,740	7,913,296	*18.6
Md. other 2 cities	771,277	1,284,785	†40.0
Washington, D. C.	13,731,756	15,887,478	†13.6
Wheeling, W. Va.	885,330	673,871	*31.4
Cleveland	13,948,413	13,028,294	*7.1
Cincinnati	6,651,475	7,806,369	†14.8
Columbus	5,133,591	3,598,601	*42.7
Ohio other 7 cities	8,088,225	6,847,529	*18.1
Indianapolis	8,194,311	7,156,560	*14.5
Indiana other 7 cities	5.428,438	4,172,538	*30.1
Chicago	96,932,700	90,559,580	*5.9
Illinois other 10 cities	11,140,318	11,101,936	*0.3
Detroit	17,624,540	14,301,450	*23.2
Michigan other 5 cities	3,746,661	4,719,654	†20.3
Milwaukee	9,797,580	1,587,551	†15.4
Wisconsin other 2 cities	1,517,197	1,235,480	*22.8
St. Louis	19,600,063	23,783,272	†17.3
Kansas City	13,783,196	13,368,738	*3.1
Missouri other 4 cities	2,106,525	3,121,920	†32.5
Louisville	3,811,838	3,096,876	*23.1
Kentucky other 3 cities	849,275	660,270	*28.6
Minneapolis	14,363,830	13,092,410	*9.7
St. Paul	10,052,011	12,089,453	†16.8
Minnesota other 2 cities	13,426,765	3,810,227	*252.4
Omaha	6,250,988	7,204,140	†13.2
Nebraska other 2 cities	1,544,210	1,976,191	†21.9
Kansas 4 cities	6,257,243	6,738,886	†7.1
Iowa 7 cities	12,587,167	10,845,669	*16.1
Denver	11,319,955	11,553,983	†2.0
Colorado other 2 cities	1,469,239	1,341,485	*9.5
Sioux Falls, S. D.	949,850	445,830	*113.1
Reno, Nev.	361,865	274,215	*32.0
Salt Lake City, Utah	4,461,600	8,077,820	†44.8
Ogden, Utah	1,400,970	752,100	*86.3
San Francisco	22,016,756	29,692,668	†25.9
Los Angeles	21,684,100	13,260,703	*63.5
Oakland	6,913,643	5,318,512	*30.0
California other 7 cities	12,388,340	10,783,044	*14.9
Portland, Ore.	20,886,202	13,481,380	*54.9
Seattle	17,418,078	19,044,335	†8.5
Spokane	5,883,484	8,766,226	†32.9
Washington other 2 cities	3,481,448	5,942,764	†1.4
Richmond, Va.	4,012,822	3,574,812	*12.3
Norfolk, Va.	1,631,309	2,456,953	†33.6
North Carolina 3 cities	2,101,541	1,733,428	*21.2
South Carolina 2 cities	1,139,167	529,731	*115.1
Atlanta	7,405,950	5,551,951	*33.4
Georgia other 4 cities	2,594,692	2,355,073	*10.1
Jacksonville, Fla.	3,184,940	2,310,025	*37.9
Alabama 2 cities	4,318,806	2,888,777	*49.3
Meridian, Miss.	296,108	249,450	*18.3
New Orleans	4,483,730	5,165,512	†13.2
Dallas	4,199,040	3,393,683	*23.7
Texas other 6 cities	11,836,959	11,696,168	*1.2
Little Rock, Ark.	1,384,423	1,531,097	†9.6
Oklahoma City	5,493,203	5,903,270	†6.9
Memphis	6,282,553	4,324,377	*45.3
Tennessee other 3 cities	3,643,866	4,302,795	†15.3
Total 200 cities	941,718,777	995,533,907	†5.4
Outside New York	733,641,745	727,518,726	*0.8

* Increase † Decrease

The result for Greater New York naturally possesses primary interest, covering, as it does, over 22 per cent. of the whole aggregate given in the table. For the combined boroughs the building operations entered into in 1910 covered an estimated expenditure of $208,077,032 and showed a falling off of 22.4 per cent. from 1909, Manhattan recording a loss of 24.8 per cent., Brooklyn 42.1 per cent. and Queens 16.5 per cent. The Bronx, on the other hand exhibited an increase of 8.9 per cent, and Richmond 22.5 per cent. Compared with 1908 every borough records gains, but contrasted with 1907 only Manhattan and the Bronx are in that category.

Outside Greater New York our returns for the Middle States embrace a total of 46 cities, and among them increases and decreases are quite equally distributed. Important cities showing losses include Buffalo, Schenectady, Yonkers, Troy, Newark, Trenton, Patterson, Passaic, the Oranges, Philadelphia, Pittsburgh, Scranton, Wilkes-Barre, Harrisburg, and Washington. On the other hand Rochester, Syracuse, Albany, Bayonne, Allentown, Erie, Reading, Wilmington and Baltimore record gains. The total for the 48 cities (other than New York) in that section which our compilation covers exhibits a decrease of 11.6 per cent. from 1909, and gains of 34,7 per cent. and 16.4 per cent., respectively, over 1908 and 1907.

In New England there are some fair-sized gains, notably at Boston, Fall River, Lowell, New Bedford, Springfield, Hartford and New Haven, and losses appear at Worcester, Holyoke, Lawrence, Lynn, Chelsea, Portland, Manchester, Providence and Bridgeport. The aggregate for the 35 municipalities from which we have reports falls below 1909 by 3.7 per cent., while exceeding 1908 and 1907 by 43.4 per cent. and 26.7 per cent., respectively. The Middle West has done rather better than the sections already referred to, gains being more numerous at larger cities. Among those reporting greater activity in 1910 than in 1909 may be mentioned Chicago, Cleveland, Columbus, Indianapolis, Detroit, Toledo and Louisville; losses are to be noted at Cincinnati, Milwaukee and Youngstown. The 42 cities that have reported to us for 1910 reveal in their totals excesses of 6.9 per cent., 35.5 per cent. and 32.3 per cent., respectively, compared with the three preceding years.

On the Pacific Slope the exhibit is one of decided contrasts. Among leading cities Los Angeles, Portland, and Oakland record large gains, and San Francisco, Seattle, Spokane and Tacoma losses. Combined, the 15 returns we have from the states of California, Washington and Oregon discloses an excess over 1909 of 4.1 per cent., a gain over 1908 of 19.5 per cent., but a loss from 1907 of 8.6 per cent., the extreme activity at San Francisco in that year explaining the decline. The "Other Western" states comprising the territory west of the Mississippi River to the Pacific Slope in the main indicate a let-up in building activity in 1910. The total for the whole section displays a gain over 1910, but this is due entirely to the exceptional operations at Duluth, where plans were filed by the United States Steel Corporation for a new plant to be erected involving an outlay of $10,000,000. Aside from the large gain at Duluth, increases are shown at such cities as Kansas City, Minneapolis, Cedar Rapids, Fort Dodge and Waterloo, and losses of greater or less extent at St. Paul, St. Louis, Omaha, Salt Lake, Topeka and Des Moines. The average addition for the 31 cities making returns is 1.8 per cent. as compared with 1909 and 35.1 per cent. and 27.4 per cent., respectively, as compared with 1908 and 1907.

The South and Southwest are represented in our table by 30 municipalities, and of these, leading ones recording gains are Atlanta, Richmond, Birmingham, Dallas, Jacksonville, Memphis, Houston and Chattanooga; diminution in activity is seen at New Orleans, Norfolk, Nashville, Fort Worth, Oklahoma and San Antonio. In the total of all there is an augmentation of 10.1 per cent. over 1909 and increases of 41.2 per cent. and 37.9 per cent. compared with the two earlier years.

Finally, for the whole country outside of New York the increase as contrasted with 1909 is 0.8 per cent., while, compared with 1908 and 1907 there are gains of 34.1 per cent. and 21.3 per cent.

Fire-Resisting Wood.

Owing to its great convenience, economy, and pleasing appearance in building construction and allied industries, timber will probably remain one of the most generally used structural materials so long as supplies are available at reasonable prices. It is desirable, however, in deference to modern views on fire resisting construction, that timber should no longer play the part of welcoming every outbreak of fire in buildings and of providing excellent fuel for flames. The art of rendering wood of all kinds proof against catching fire is one to which sspecial attention is being devoted by the Timber Fireproofing Company, Ltd. The process adopted by this firm consists in submitting wood to vacuum treatment in a closed steel cylinder, where air, moisture, and sap are removed and a chemical solution is forced into the pores and fibres under hydraulic pressure, the timber being afterwards dried in a kiln.

Timber so treated retains its normal strength and quality; it can be worked, painted, polished, nailed, or glued in precisely the same way as untreated wood, from which it differs only in the respect that the stable and non-volatile impregnating crystals impart such resistance to fire that splinters taken from a sample may be held in the flame of a Bunsen burner or in an electric arc without more than local carbonization at the point of contact. No flame is spread, and on removal of the source of heat the charring ceases.

It should be recognized that the object of fire-resisting wood is not to compete with materials calculated to withstand great heat without serious injury. On the contrary, its purpose is to prevent any small outbreak of fire from growing into a serious conflagration. Apart from papers and textile fabrics, ordinary timber is the substance chiefly responsible for feeding the infant flames of a building fire. The timber floors, wainscotting, stairs, doors, window-panes, and other details of the average building constitute the real danger of a conflagration, because when once the woodwork is fairly alight it goes on burning with increasing violence until finally the whole structure is enveloped in flames. It is evident, therefore, that anything calculated to remove or minimize this danger is of much public importance, and for this reason we have pleasure in calling attention to the process briefly described in the present note. We may add that the cost of impregnation is by no means prohibitive, and that wood so treated has been largely used by the Office of Works, several county and municipal authorities, railway companies, and industrial firms in building construction and other works in England.

Co-operative Apartment Blocks.

How far will the co-operative apartment block, with every occupant of a suite a part owner, interfere with the development of the building of individual dwellings? This is a question of growing importance to the builder who specializes in dwellings and residences. The co-operative apartment block is said to have been successful across the border.

In the cases where the stockholders erect their own building it is naturally put up to conform with the views of the majority as to design and material used. This enables them, if they wish, to use the best material in its construction and the most modern appliances in the fittings; and no one knows better than the managers of real estate that in the end the best is always the most economical. It is especially true in this case, as the individual owner has to make all repairs in his own apartment, except where the damage is caused by outside influences or by the breakage of the main lines of the supply and waste.

Each owner, explains a writer in the *National Real Estate Journal*, is also able to plan the size and arrangement of the rooms in his own apartment, this privilege being limited by the unavoidable demands of architect and builder. The decorations are done at his own expense, so he can suit his own taste and be extravagant or economical as he chooses. In cases where the stockholders purchase a building already constructed, they often make many changes to meet personal requirements, feeling, as they do, that it is to be their permanent home and not one at the suffrance of an uncertain and perhaps avaricious landlord or manager.

The management of the building is generally under the control of a house committee, appointed by the directors, and as each stockholder is a director he has an influential voice through his committee in the running of the building. The committee is also usually empowered by the directors to decide upon the eligibility of proposed tenants. This scrutiny is unquestionably a most decided advantage to the owners, as no one wants a home among undesirable neighbors.

If, as frequently happens, an owner wishes to give up his apartment temporarily or permanently, he can either rent to an eligible tenant and obtain a very good return on his investment, or find a purchaser, who must also pass the scrutiny of the directors. In some corporations the would-be seller is required to offer his stock to the company before he can otherwise transfer it.

A final advantage, and one which cannot fail to interest the homeseeker, is the low annual cost of such an apartment, which, in a well-located and well-organized scheme, would be merely the interest on the money invested. The reason for this is one of the mysteries to the layman, but is easily explained by the fact that the usual large net return to the owner of the ordinary apartment house accrues in a co-operative apartment to the benefit of the stockholder, being in the one case in the form of net income, in the other of reduced rent.

The form of ownership is very simple. A corporation is formed to escape the individual liability which a partnership agreement would entail, and as it is formed solely for the purpose of holding the property, it is capitalized at an amount equal to the equity only. Each subscriber to the stock has a privilege of a lease of an apartment in the building, its size and location depending upon the amount of his subscription. These "proprietary leases," as they are called, run for a term of from twenty-one years, with renewal privileges to perpetuity and specify that the tenant is owner of a certain number of shares of the capital stock of the company.

These leases are cancelled prior to their expiration should the following contingencies arise: First. In case the tenant shall cease to be the owner of, and cease to have standing in his name, at least the number of shares of stock specified. In the event of the death of the tenant this provision is suspended, to give time to arrange for a transfer of the stock, either to the legatee or a satisfactory purchaser. Second. In case at any time the company shall decide to sell the property. Such a sale has to be approved by an affirmative vote of 75 per cent. of the stock at a meeting duly called for the purpose.

The rent specified is generally about 40 per cent. of the rental value of the apartment, with the additional clause that should there be a deficiency in the current expenses the tenant, whom I have spoken of also as the owner, may be called upon to pay on the next rent day such proportion of the deficiency as his stock bears to the capital stock of the company. Should there be a surplus instead of a deficiency, this insures in like manner to the benefit of the stockholder. Except for these clauses, a proprietary lease is very similar to an ordinary one.

The methods used up to the present time for financing a co-operative apartment are three in number, each of which I will briefly explain. The simplest, but the most rarely used, is the one where all the apartments are occupied by the owners. In this case there is no outside source of income, and hence each owner has to pay his share of the expenses in the proportion that his stock bears to the total stock of the company. You will readily see that the greater number of subscribers in this co-operative plan lessens the amount of individual capital required. The pecuniary benefit, however, is overbalanced by the increased individual annual expense, and this same large number of owners makes the corporation more unwieldly, besides increasing the chance of friction in which should be a happy family.

The second scheme, the most popular, and, in my opinion, the best, is one in which the apartments taken by the stockholders amount to between 40 per cent. and 45 per cent. of the rental value of the entire building, the remaining 55 or 60 per cent. being rented to non-stockholders. As it has been found that the running expenses, including taxes and interest, of an apartment house, are approximately 60 per cent. of the rental value, it will be apparent that in this scheme the annual charge to stockholders is very small.

As in the first plan, the large number of owners decreased the initial expense, but increased the likelihood of friction, so in this latter plan the smaller number reverses these conditions.

The popularity of this scheme seems to be heightened by the chance which each owner takes on the annual cost of his apartment, a chance which strongly appeals to the speculative instinct so deeply rooted in human nature.

The results of the third scheme are similar to the second, but are obtained in a different way. In this plan the stockholder pays exactly the same rent, relatively, as the non-stockholding tenant, but is partially or wholly reimbursed by dividends out of the net income of the property.

Attractive Suburban Cottage Finished in Cement Stucco

Residence of Clarence W. Noble, overlooking Lake Ontario, Kew Beach, Toronto. Simple, Attractive, English Cottage Design. Lawrence Buck, Architect.

J. HARVEY SELF—Architect.

From a residential standpoint, Toronto is essentially brick, for journey in whatever direction you will, houses of this description are in preponderance. Not only is this the case in Toronto, but more or less throughout the whole of Canada.

But the cement stucco house marks the completion of an evolution destined in the near future to completely revolutionize building methods in Canada. The stucco house is no longer a speculation, but a definite quality. It presents possibilities in domestic architecture possessed by no other material, due to its plasticity, color, small cost and fire-proof qualities.

We present to our readers in this issue the residence of C. W. Noble, situated at Kew Beach and designed by Lawrence Buck of Chicago. The elevations show the delightful use of cement stucco for this type of house, situated as this one is, surrounded by numerous pines and birch trees on a low bank overlooking Lake Ontario. But while the house described is admirably adapted for the surroundings, it is one that will prove itself popular throughout the whole of Canada, particularly in the province of British Columbia.

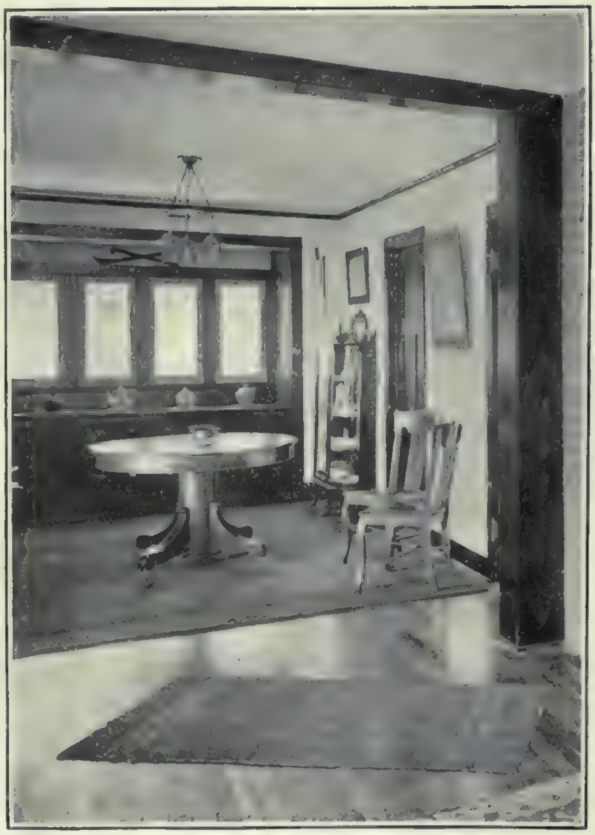
In construction the frame for the cement exterior differs but slightly from that for wood siding. Usually sheathing is put on the outside of the studs, as it was in this case. Upon this is tacked hair-felt or asbestos, and then seven-eighths by two inch furring strips are nailed vertically. But an admirable and cheaper way is to omit the sheathing and strapping. Nail the metal lath on the studs and cover on the outside before any interior plastering is done, with a coat of cement mortar. After this has set, put a heavy second coat on the key back of the first from the inside between the studs, thus embedding the metal lath and protecting it from rust. The third or rough coat should be applied outside and should be kept from drying too rapidly by careful spraying. This is to prevent cracks.

Unfortunately a stucco finished house has been criticised from the standpoint of lasting quality owing to failures directly traceable to poor workmanship and frame work design. But stucco when properly made and applied will endure indefinitely. The construction of the framework, the studs which should extend from sill to roof where possible, the manner of mixing, the application and care of the walls after the plaster has been applied, make it a problem which requires expert skill in handling to ensure the best results.

The house presented gives a simple, home-like effect due to the low, broad outline, the general color scheme together with the broad eaves and effectively grouped casement windows.

The plan is well arranged. Entrance is from the north through a moderate-sized vestibule to a hall which is really part of the living-room. The living-room is finished to conform to the exterior design, in a simple home-like manner, with a large brick fire-place and seat. The room has a south-eastern exposure and is well lighted on both sides. Entrance to the dining-room is through the living-room. This room is one of the best in the house. It is well lighted from the south and west and is neatly but simply finished in selected pine and birch. A pleasing feature of this room is the large china cabinet with casements over, situated at the end of the room. Separate entrances are furnished for the kitchen, both on the north and east elevations. Pantry space is small but handy and adequate. A useful feature of the kitchen is the hood over the ranges with vent pipes to flue.

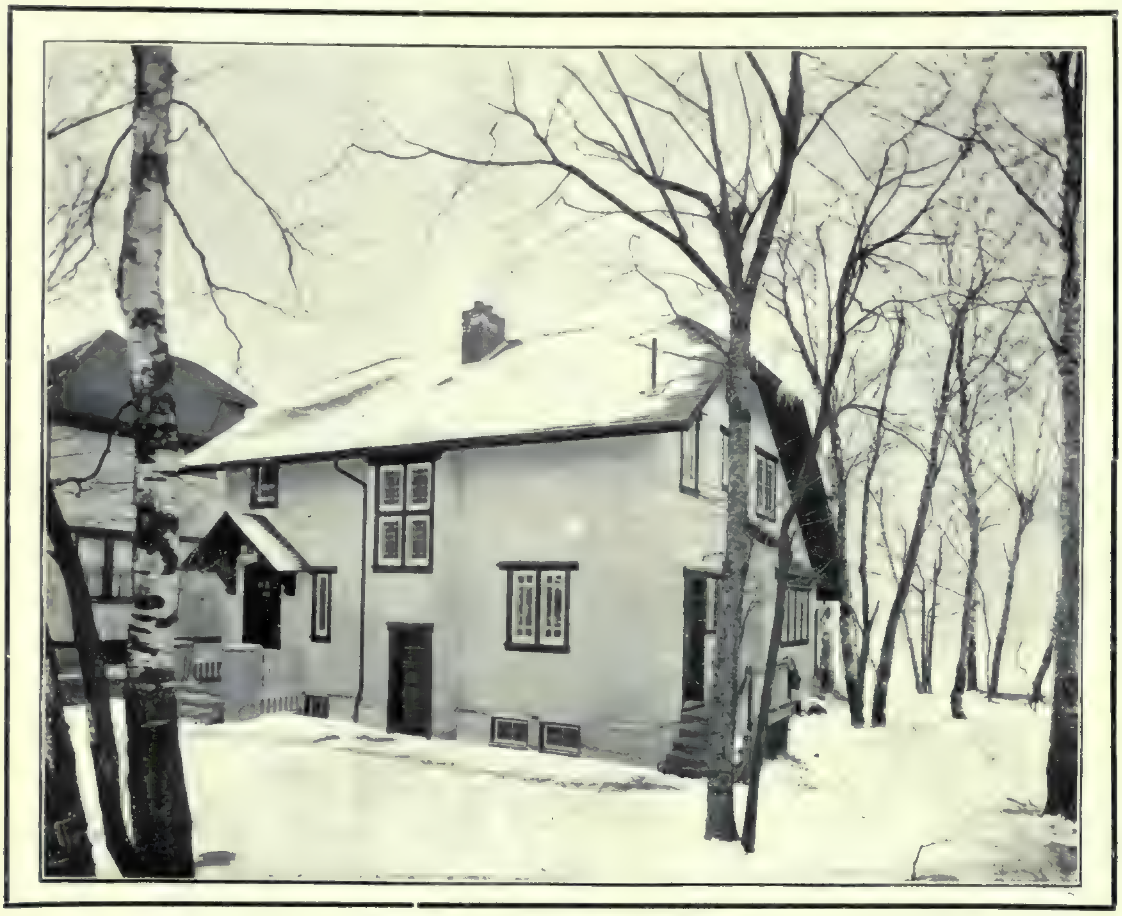
A wide enclosed stairway leads to the upper story. The upper hall is light, with little waste room. Four moderate-sized bed-rooms with plenty of closets open off the hall. These are finished in clear white pine and red birch.



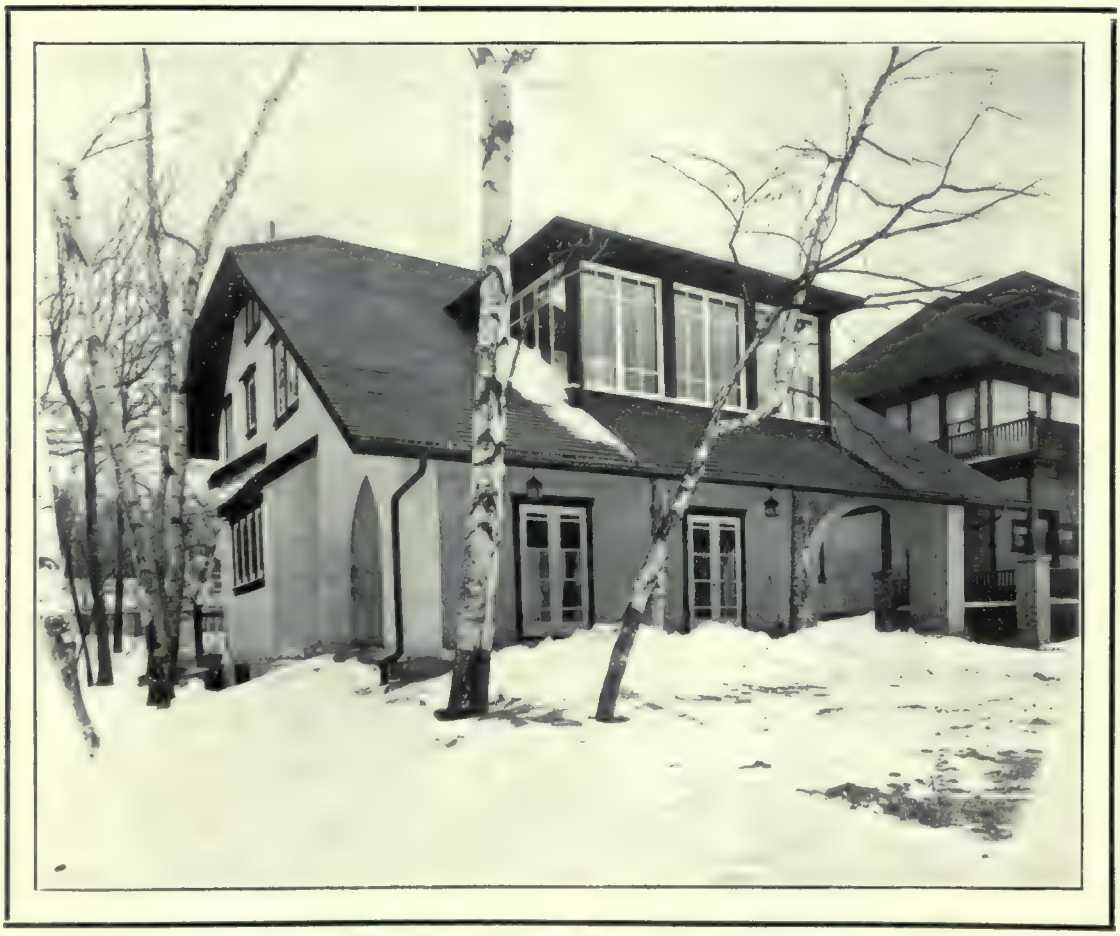
View of Dining Room.

The bath-room is not large but is convenient, well lighted and arranged. The feature of the second story is the large sleeping porch (overlooking the lake), fitted with removable sash.

The floors throughout are selected red birch laid on



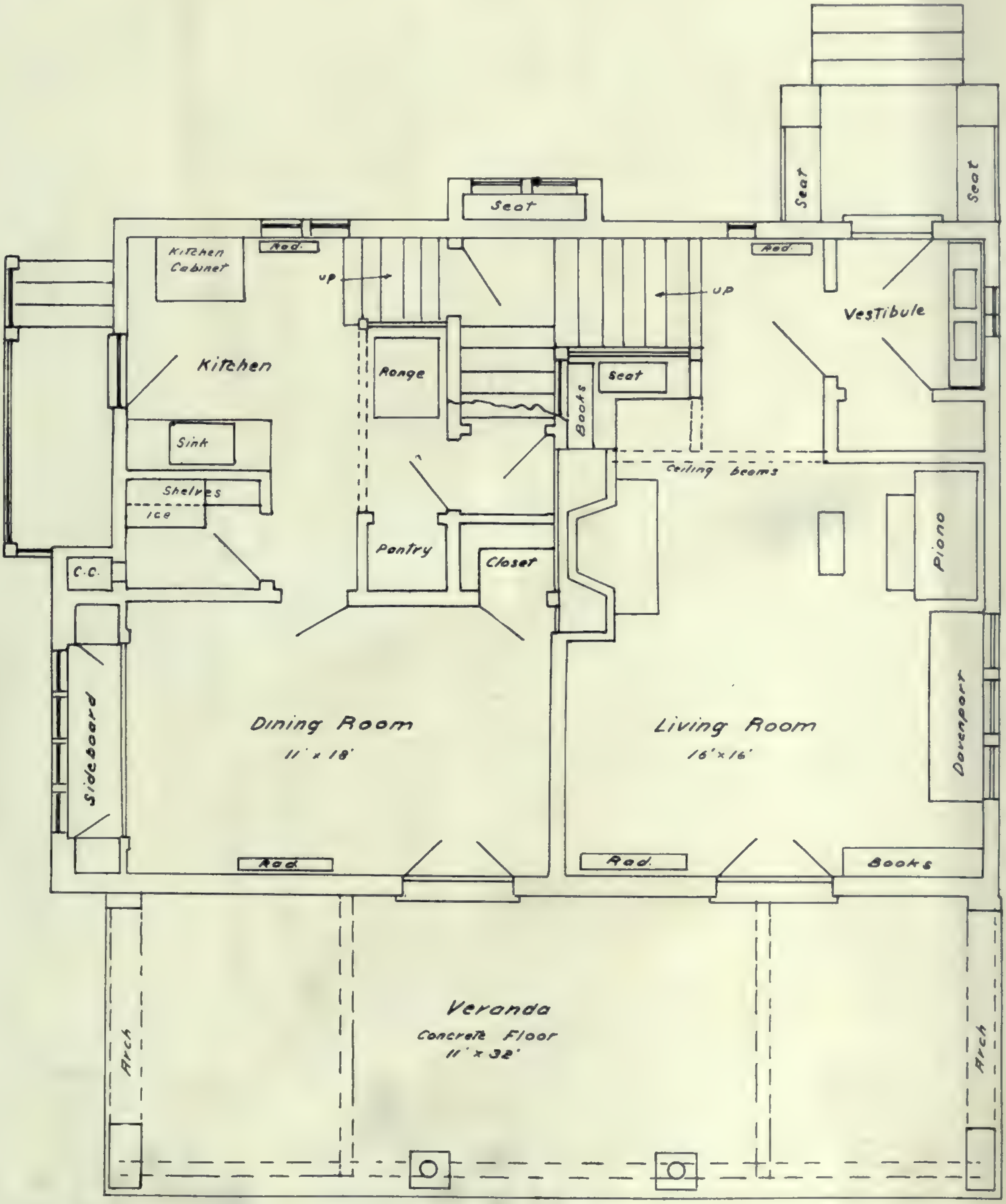
Exterior of Cottage facing North



Exterior of Cottage facing the Lake

rough pine flooring with hair-felt between. Hair-felt is used behind all window and door frames. Brick filling prevents fire, draughts, etc. from rising from basement, but free passage of air is allowed above the ground floor in order to keep the house perfectly warm. All bridging is only half width of exterior partitions to meet this requirement.

This beautiful little home was designed by the architect, Lawrence Buck, and was finished according to his plans and specifications in cement stucco, which, as I previously said, will revolutionize building in many parts of Canada. But should anyone desire to erect a house somewhat after the design here submitted but not in stucco, the writer is of the opinion that from an esthetical stand-point, this house would look fine if built in deep red stock brick with grey stone trimmings and large white mortar joints with woodwork in light colors.



Ground Floor Plan

Application of Cement Stucco

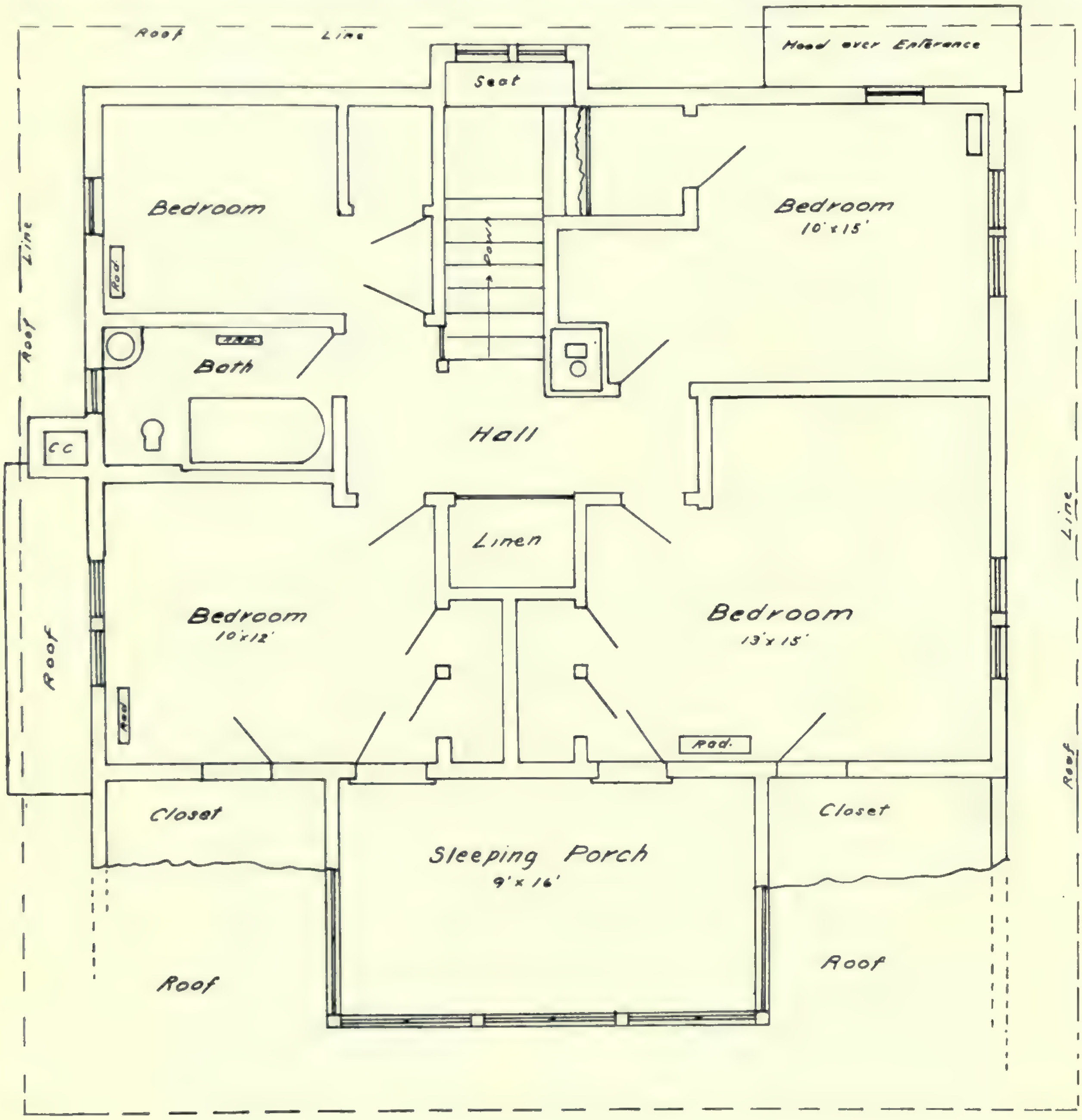
***C. E. WEBB, B. A. Sc.**

Any discussion of stucco houses must first be prefaced with a comparison of the existing methods of veneering exterior walls and this appeals to the prospective builder from the standpoints of appearance, and cost.

It comes to him quite forcibly when he contemplates building himself a home. He is confronted with a problem. He wants to put up a nice house, something odd, not too expensive, but which will conform with the general beauties of his surroundings.

Hitherto he had to choose between a brick or wood exterior. If he wished to put up a stucco dwelling he was told that it was not durable, that the plaster cracked and had a dirty, poor appearance, and, indeed, his own experience told him so. What did he do? He either built a fire-trap of wood, or sacrificed his original idea of building a quaint structure, and put up a brick house at an increased cost. But now with the advent of metal lath he is able to build a house at reasonable cost, which will give scope to any artistic effects he may wish. There are, however, several features in a building of this nature to which due attention must be given in order to attain the required results. These will be treated later in this article.

The arguments adverse to frame houses are that the outside woodwork, siding and trim are too short-lived; lumber now generally obtainable will not stand the weather and even when frequently painted seems to go to pieces in a surprisingly short time, and thus adds to the already large bill for painting. Hence a prospective builder, considering this matter, is deterred from building, or is persuaded to use some of the more expensive forms of con-

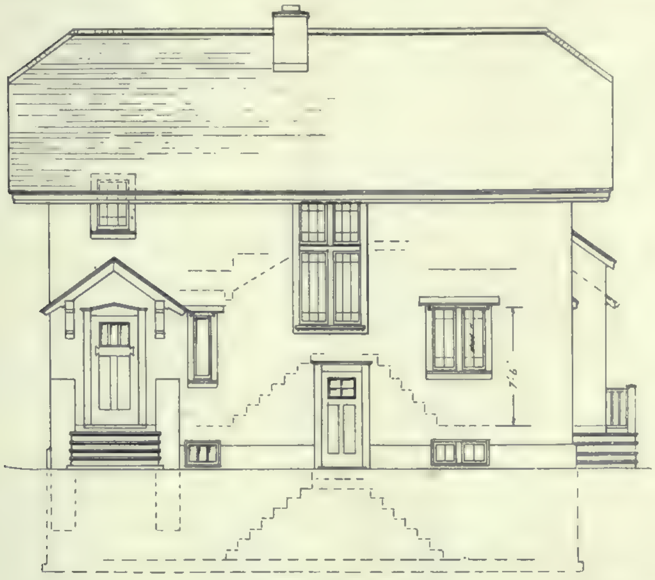


First Floor and Roof Plan

---

*Assistant Engineer with C. W. Noble, C.E., Fire-proofing Engineer, Toronto.

struction, brick or tile or cement. A cement plaster applied at some future time may solve the problem for such wood structures. This is easily done. When the clapboard or other exterior finish has become so dilapidated that the house is no longer trim and snug, or when for any reason it is desired to renew the exterior, metal lath is nailed directly to the sheeting, preferably a grade which does not require the addition of furring strips and cement plaster in two coats is applied to it. This plaster coat is thoroughly weather and water-proof and the lime in the mortar prevents further decay of the wood. The cost of this is hardly in excess of twice the cost of a good job of painting. This type of construction lends itself to the variety of finishes possible in plastering. It is efficient, and from an artistic point of view has been tested and success is assured.



NORTH ELEVATION J. M. SELF TORONTO

In building a cement stucco house the following specifications are suggested:—The intent of these specifications is to obtain a sound, permanent and waterproof finish free from cracks and unsightly blemishes.

Specifications

Materials.—The materials composing the stucco shall consist of—

1. Portland cement shall fulfill the requirements of standard specifications for Portland cement as adopted by the Canadian Society of Civil Engineers.

2. Sand shall be clean and shall be free from clay, loam, mud, sticks, organic matter or other impurities, and shall be of uniformly graded size from coarse to fine.

3. Hydrated lime which has been slaked in an excess of water and allowed to stand at least a week before being used.

Proportions.—The proportions of the above specified materials by volume shall be five parts cement, twelve parts sand and one part of the putty. To the scratch coat a sufficient quantity of long cow hair shall be added to make the same adhere to the lath.

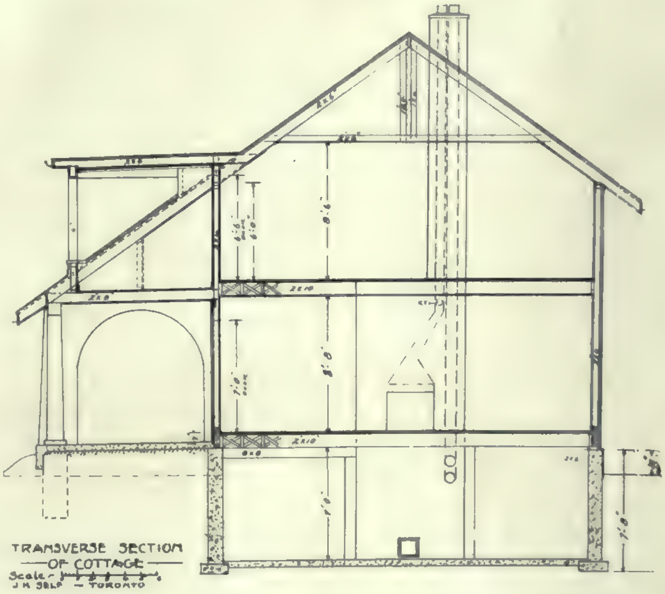
Mixing—The cement and sand shall be thoroughly mixed enough water added to give it the proper consistency. The lime paste shall then be added, and the whole composition thoroughly mixed until perfectly homogenous. No material shall be allowed to stand over thirty minutes before applying.

Application.—The face of the first coat shall be thoroughly scratched to form a key for the finish coat which shall be applied to a total thickness of one inch when the first coat is sufficiently hard to safely hold it. Any desired finish may be used, but the last coat must be free from porous imperfections.

The stucco shall be thoroughly waterproofed. Any standard compounds being used. Special care shall be taken to avoid too rapid drying.

The most important thing, and hitherto the most difficult problem in building a stucco house, is the preventing of unsightly cracks. A careful study of this problem has revealed the reasons for their appearance. They are caused chiefly by the lateral expansion of the wood in the bond timber which is generally placed between the respective stories of the building. It is a well-known fact that a piece of timber will expand when wet not in a direction parallel to the grain of the wood, but transversely or across the grain. Hence if a wood lath be used the continual wetting of the exterior of the building will cause a multitude of cracks to appear, and eventually the plaster will fall off. For the same reason if a bond timber be placed between the stories a crack is almost sure to develop. This is overcome by running the studs clear to the roof wherever this is possible. In the case of openings a header has to be put in, but in this case if a crack does appear it is covered by the casing. Another reason is the use of an inferior grade of metal lath. A metal lath for this work should have a lock joint, and thus prevent the possibility of a poor joint. The accompanying detail shows a typical elevation. The reader will notice that a hair-felt deadening is run between the studs. This greatly increases the warmth of the house.

If the above suggestions be carried out prospective builders will attain the results they have so long desired, and in view of the many forms that plastic cement can be worked into, should be able to build a structure that will be both beautiful and durable. The cost is also very reasonable A fair price for this class of work being in the neighborhood of $7.00 a square for the completed wall. In considering the expenditure in the light of an investment it has been the experience of many that the saving in fuel, repairs otherwise necessary and insurance has been in the neighborhood of fifteen to twenty per cent. annually on the cost of the work.



TRANSVERSE SECTION
—OF COTTAGE—
Scale
J. M. SELF — TORONTO

Quantity Survey and Estimated Cost of House

J. HARVEY SELF, Architect

EXCAVATION, BRICK-WORK AND CEMENT—

Staking out, etc.	$ 15 00
180 cubic yards excavation at 40c	72 00
9 piers at 75c	6 75
116 ft. footing trenches at 5c	5 80
Refilling	8 00
Grading	10 00
118 ft. lin. (5-course) brick wall filling at 20c	23 60
Construction of fire-place, flues, etc., complete	147 00
26 cubic yards, 10-inch concrete wall	149 50
Shoring, etc.	35 00
120 cubic feet concrete footings at 30c	36 00
9 piers, average 5 square feet each at $1.25	11 25
79 square yards concrete basement floor at 45c	35 55
403 square feet verandah floor at 13c	52 39
Incidentals	5 50
	$613 34

Note—A large amount of gravel is *on the lot.*

PAINTING AND GLAZING $283 00

METAL WORK—

53 lin. ft. of down pipe at 20c	10 60
96 lin. ft. of eave trough at 20c	19 20
14 elbows, etc.	3 50
210 sq. ft. galv. iron roof at 10c	21 00
72 lin. ft. flashing at 8 c.	5 76
2 scuppers and flashing	4 60
12 ft. ventilating pipe in kitchen at 25c	3 00
Metal hood in kitchen	9 50
Registers, etc., for same	2 50
Incidentals	5 00
	$ 84 66

FRAMING LUMBER

5 pieces	2 x 6 in.x10 ft.	No. 1 Hemlock for sills	= 50 board feet at	$20 00	per M.	= $6 32
3 pieces	2 x 6 in.x12 ft.	No. 1 Hemlock for sills	= 36 board feet at	20 00	per M.	
3 pieces	2 x 6 in. x16ft.	No. 1 Hemlock for sills	= 48 board feet at	20 00	per M.	
1 piece	8 x 8 in.x10 ft.	No. 1 Hemlock for girders	= 54 board feet at	20 00	per M.	
2 pieces	6 x 8 in.x10 ft.	No. 1 Hemlock for girders	= 80 board feet at	20 00	per M.	
1 piece	6 x 8 in.x12 ft.	No. 1 Hemlock for girders	= 48 board feet at	20 00	per M.	
56 pieces	2 x 4 in.x18 ft.	No. 1 Hemlock for exterior studding	=672 board feet at	24 00	per M.	= 16 13
27 pieces	2 x 4 in.x22 ft.	No. 1 Hemlock for exterior studding	=396 board feet at	27 00	per M.	= 10 70
6 pieces	2 x 4 in.x16 ft.	No. 1 Hemlock for exterior studding	= 64 board feet at	21 00	per M.	= 1 35
32 pieces	2 x 4 in.x12 ft.	No. 1 Hemlock for exterior studding	=256 board feet at	19 00	per M.	= 5 42
4 pieces	2 x 4 in.x14 ft.	No. 1 Hemlock for exterior framing	= 29 board feet at	19 00	per M.	
34 pieces	2 x 4 in.x10 ft.	No. 1 Hemlock for exterior framing	=233 board feet at	21 00	per M.	= 35 20
38 pieces	2 x 4 in.x 8 ft.	No. 1 Hemlock for exterior framing	=203 board feet at	21 00	per M.	
114 pieces	2 x 4 in.x10 ft.	No. 1 Hemlock for interior studs	=760 board feet at	21 00	per M.	
18 pieces	2 x10 in.x16 ft.	No. 1 Hemlock for ground floor joists	=480 board feet at	21 00	per M.	
16 pieces	2 x10 in.x12 ft.	No. 1 Hemlock for ground floor joists	=320 board feet at	19 00	per M.	= 11 40
12 pieces	2 x10 in.x14 ft.	No. 1 Hemlock for ground floor joists	=280 board feet at	19 00	per M.	
5 pieces	2 x 6 in.x 8 ft.	No. 1 Hemlock for ground floor joists	= 40 board feet at	21 00	per M.	= 84
7 pieces	2 x10 in.x24 ft.	No. 1 Hemlock for first floor joists	=280 board feet at	28 00	per M.	= 7 84
19 pieces	2 x10 in.x16 ft.	No. 1 Hemlock for first floor joists	=500 board feet at	21 00	per M.	= 10 50
25 pieces	2 x 8 in.x12 ft.	No. 1 Hemlock for first floor joists	=400 board feet at	19 00	per M.	= 9 82
5 pieces	2 x10 in.x14 ft.	No. 1 Hemlock for first floor joists	=117 board feet at	19 00	per M.	
6 pieces	2 x10 in.x 8 ft.	No. 1 Hemlock for first floor joists	= 80 board feet at	21 00	per M.	= 1 68
24 pieces	2 x 6 in.x18 ft.	No. 1 Hemlock for ceilings and decks	=432 board feet at	24 00	per M.	= 10 36
13 pieces	2 x 6 in.x12 ft.	No. 1 Hemlock for ceilings and decks	=156 board feet at	19 00	per M.	= 2 96
48 pieces	1 x 4 in.x 8 ft.	Hemlock for roof straps	=128 board feet at	20 00	per M.	= 2 56
6 pieces	1 x 6 in.x16 ft.	Pine for ribbon boards	= 48 board feet at	36 00	per M.	= 1 73
20 pieces	1 x 6 in.x12 ft.	Pine for braces	=120 board feet at	36 00	per M.	= 4 32
46 pieces	2 x 6 in.x16 ft.	Hemlock rafters, No. 1 szd.	=736 board feet at	21 00	per M.	= 15 46
30 pieces	2 x 6 in.x18 ft.	Hemlock rafters	=540 board feet at	24 00	per M.	= 12 96
6 pieces	2 x 6 in.x14 ft.	Hemlock rafters	= 84 board feet at	19 00	per M.	= 1 60
10 pieces	2 x 6 in.x10 ft.	Hemlock rafters	=100 board feet at	21 00	per M.	= 2 10
2 pieces	2 x 8 in.x14 ft.	Hemlock ridge rafters	= 38 board feet at	19 00	per M.	= 72
4 pieces	2 x 8 in.x10 ft.	Hemlock valley rafters	= 54 board feet at	21 00	per M.	= 1 13
6 pieces	2 x 4 in.x 6 ft.	Hemlock porch roof	= 24 board feet at	19 00	per M.	= 45
11 pieces	2 x 4 in.x 4 ft.	Hemlock bay roof	=103 board feet at	19 00	per M.	= 1 95
		Total framing lumber				$174 50

1900 lineal feet	1 x2 in.	strips	$ 0 40	per hundred	=$ 7 60
250 lineal feet	2 x2 in.	bridging	80	per hundred	= 2 00
20 pieces	1 x2 in.x18 ft.	bridging	1 00	per hundred	= 3 60
1750 sq. feet	⅞ in.	matched Hemlock sheathing	20 00	per M.	= 105 70
1680 sq. feet	⅞ in.	matched Hemlock roofing	20 00	per M.	
1855 sq. feet	⅞ in.	matched Hemlock flooring	20 00	per M.	
90 sq. feet	⅜ in.x2 in.	Cypress	60 00	per M.	= 5 40
30 sq. feet	½in.x4in.	White Pine	35 00	per M.	= 1 05
16,300		B.C. Cedar shingle	3 50	per M.	= 57 05
180 lin. feet or 120 bd. feet	1x8 in.	facia boards	36 00	per M.	= 4 32
490 sq. feet	⅞ in.	T. & G. White Pine flooring	30 00	per M.	= 14 70
1300 sq. feet	⅞x2¼in.	Red Birch flooring	50 00	per M.	= 65 00
56 sq. feet	1⅛ in.	T. & G. selected	45 00	per M.	= 2 52
		Total			$443 44

These costs are based on average Toronto conditions, they will vary in different parts of Canada and are only given as a basis for comparison. A complete set of working Blue Prints and Detailed Bill of Materials may be obtained from Dept. K. The Builder and Contractor.

8 pieces	⅞x12 in.x10 ft. shelving	= 80 board feet at	$45 00	per M.	=$ 3 60
2 pieces	⅞x10 in.x10 ft. shelving	= 18 board feet at	40 00	per M.	= 72
2 pieces	⅞x 6in. x12 ftoutside finish	= 72 board feet at	36 00	per M.	= 9 36
2 pieces	⅞x 6 in.x10 ft. outside finish	= 10 board feet at	36 00	per M.	
2 pieces	⅞x 6 in.x14 ft. outside finish	= 14 board feet at	36 00	per M.	
5 pieces	⅞x 6 in.x16 ft. outside finish	= 40 board feet at	36 00	per M.	
4 pieces	⅞x 4 in.x10 ft. outside finish	= 14 board feet at	36 00	per M.	
9 pieces	⅞x 4 in.x12 ft. outside finish	= 36 board feet at	36 00	per M.	
9 pieces	⅞x 4 in.x14 ft. outside finish	= 42 board feet at	36 00	per M.	
6 pieces	⅞x 4 in.x16 ft. outside finish	= 32 board feet at	36 00	per M.	
2 pieces	1⅛x 8 in.x 8 ft. balcony rail	= 14 board feet at	45 00	per M.	= 1 31
1 piece	1⅛x 8 in.x18 ft. balcony rail	= 15 board feet at	45 00	per M.	
10 pieces	1 x 4 in.x16 ft. ground floor white pine casing		1 50	per 100 ft. run	= 6 78
14 pieces	1 x 4 in.x14 ft. ground floor White Pine casing		1 50	per 100 ft. run	
4 pieces	1 x 4 in.x12 ft. ground floor White Pine casing		1 50	per 100 ft. run	
1 piece	1 x 4 in.x 8 ft. ground floor White Pine casing		1 50	per 100 ft. run	
4 pieces	1 x 4 in.x10 ft. ground floor White Pine casing		1 50	per 100 ft. run	
2 pieces	1 x 8 in.x10 ft. ground floor White Pine casing		36 00	per 100 ft. run	= 48
3 pieces	1⅛x 4 in.x12 ft. window stools		2 50	per 100 ft. run	= 4 60
2 pieces	1 x 6 in.x16 ft. ground floor base		2 50	per 100 ft run.	
8 pieces	1 x 6 in.x12 ft. ground floor base		2 50	per 100 ft. run	
2 pieces	1 x 6 in.x10 ft. ground floor base		2 50	per 100 ft. run	
4 pieces	1 x 6 in.x10 ft. ground floor jambs		2 25	per 100 ft. run	= 4 14
18 pieces	1 x 6 in.x 8 ft. ground floor jambs		2 25	per 100 ft. run	
96 sq. feet	V sheeting—living room seat	= 96 board feet at	36 00	per M.	= 3 45
2 pieces	1⅛x 4 in.x14 ft. Pine for seats	= 28 board feet at	45 00	per M. strip	= 1 71
1 piece	1⅛x 4 in.x10 ft. Pine for seats	= 10 board feet at	45 00	per M. strip	
1 piece	⅞x 4 in.x14 ft. Pine for seats	= 14 board feet at	36 00	per M. strip	= 50
1 piece	1⅛x15 in.x 4 ft. Pine for sink top	= 4 board feet at	50 00	per M. strip	= 20
1 piece	1⅛x 4 in.x 6 ft. Pine for sink top	= 6 board feet at	45 00	per M. strip	= 27
1 piece	⅞x12 in.x 6 ft. Pine for back board	= 6 board feet at	45 00	per M. strip	= 27
1 piece	⅞x 4 in.x 8 in. Pine for back board	= 8 board feet at	36 00	per M. strip	= 28
	Total				$481 11

30 pieces	⅞x 4 in.x16 ft. first floor door casings		$1 50	per 100 ft. run	=$ 7 20
8 pieces	⅞x 4 in.x10 ft. first floor door casings		1 50	per 100 ft. run	= 1 20
12 pieces	⅞x 6 in.x14 ft. first floor door jambs		2 25	per 100 ft. run	= 3 78
4 pieces	⅞x 6 in.x10 ft. first floor door jambs		2 25	per 100 ft. run	= 90
4 pieces	⅞x 4 in.x16 ft. window casings		1 50	per 100 ft. run	= 1 68
2 pieces	⅞x 4 in.x12 ft. window casings		1 50	per 100 ft. run	
2 pieces	⅞x 4 in.x12 ft. window aprons		1 50	per 100 ft. run	
2 pieces	1⅛x 4 in.x12 ft. window stools		2 50	per 100 ft. run	= 4 60
182 lin. feet	⅞x6 in. plain base		2 50	per 100 ft. run	= 4 55
2 pieces	1¼x 3 in.x12 ft. porch seat		45 00	per 100 ft. run	= 1 08
3 pieces	1⅛x12 in.x 6 ft. white proch treads		7 00	per 100 ft. run	= 1 26
3 pieces	1⅛x10 in.x 4 ft. white porch treads		5 00	per 100 ft. run	= 60
3 pieces	⅞x 6 in.x10 ft. white porch risers	=15 board feet at	36 00	per M.	= 54
6 pieces	1⅜x12 in.x 4 ft. Birch treads		12 00	per 100 ft. run	= 6 24
8 pieces	1⅜x12 in.x3 ft.–6 in. Birch treads		12 00	per 100 ft. un	
5 pieces	1⅛x10 in.x3 ft.–3 in. Birch treads		7 00	per 100 ft. run	= 1 14
7 pieces	⅞x 6 in.x 4 ft. Birch risers .,		50 00	per M.	= 1 89
8 pieces	⅞x 6 in,x3 ft–6 in. Birch risers		50 00	per M.	
6 pieces	⅞x 6 in.x3 ft.–3 in. .Birch risers		50 00	per M.	
12 pieces	1⅛x10 in.x3 ft.–6 in. Pine treads		5 00	per 100 ft. run	= 2 10
6 pieces	⅞x 6 in.x3 ft.–6in . Pine risers		36 00	per M.	= 38
4 pieces	1⅜x14 in.x8 ft. Birch strings		15 00	per 100 ft. run	= 4 80
2 pieces	1⅛x12 in.x6 ft. Birch strings		9 00	per 100 ft. run	= 1 08
6 pieces	1⅛x12 in.x8 ft. Pine strings		9 00	per 100 ft. run	= 4 32
	Total				$526 54

UNITEMIZED—

MILL WORK—

1 piece porch rail top	3x4 in.x12 ft.	$ 8 00	per 100 ft.	=$ 0 96
1 piece porch rail bottom	2x4 in.x12 ft.	3 00	per 100 ft.	= 36
1 piece porch rail top	2x4 in.x 8 ft.	3 00	per 100 ft.	= 24
2—6	x6 in.x3 ft. cut brackets for porch	55	each	= 1 10
2—6	x6 in.x2 ft. cut braces for same	40	each	= 80
16—	⅞x3 in.x3 ft. cut pickets	05	each	= 80
24—	1½ in. square balusters	05	each	= 1 20
40—	⅞x3 in. x4 in. cove brackets for hoods	06	each	= 2 40
175 lin. ft.	2 in. bed mould	1 25	per hundred	= 2 19
112 lin. ft.	2½ crown mould	1 25	per hundred	= 1 40
144 lin. ft.	⅞ in. cove	70	per hundred	= 1 00
316 lin. ft.	quarter round	60	per hundred	= 1 90
20 lin. ft.	2-in. hardwood poles	3 50	per hundred	= 70
1—	5-in. square Pine newell	1 25	per hundred	= 1 25
4—	4-in. square plain Pine newells	1 00	per hundred	= 4 00
6 lin. ft.	Birch hand rail	12	per hundred	= 72
36 lin. ft.	2 and 2½ Pine mould	1 50	per hundred	= 54
140 lin. ft.	oak picture mould	2 00	per hundred	= 2 80
	Total			$550 81

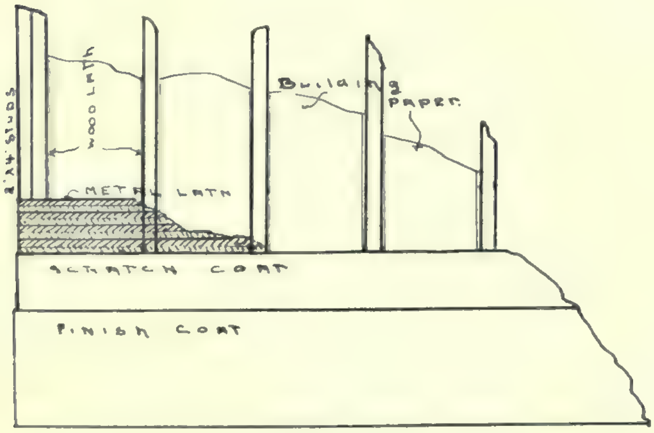
FRAMES—		
1—40x90 in. 3x6 in mullion and transom casement stair window	$3.25 each	$3.25
3—48x54 in. mullion casement		
2—24x36 in. mullion casement		
1—40x80 in. double mullion casement		
1—24x40 in casement		
1—40x66 in. triple mullion casement		
1—40x48 in mullion casement		
1—24x48 in. casement		
2—18x34 in. casement		
2—24x36 in. casement		
1—12x48 in. casement		
15 casement frames	$ 2 25 each	=$ 32 75
SASH—		
4—16x24x1⅜ in. with wood muntins	$ 0 60 each	=$ 2 40
2—18x48x1¾ in. with wood muntins	90 each	= 1 80
10—27x54x1¾ in. with wood muntins	1 25 each	= 12 50
2—21x54x1¾ in. with wood muntins	1 25 each	= 2 50
2—21x32x1¾ in. with wood muntins	90 each	= 1 80
7—24x48x1⅜ in. with wood muntins	65 each	= 8 45
4—24x40x1⅜ in. with wood muntins	65 each	
2—24x36x1⅜ in. with wood muntins	65 each	
4—18x40x1⅜ in. with wood muntins	60 each	= 4 20
2—18x34x1⅜ in. with wood muntins	60 each	
1—12x48x1⅜ in. with wood muntins	60 each	
9—18x26x1⅜ in. with wood muntins	50 each	= 4 50
DOOR FRAMES—2x6 in.		
5—3x7 ft. exterior doors	$ 2 75 each	=$ 13 75
2—4 ft–8 in.x7 ft. French windows	3 50 each	= 7 00
2—3x7 ft. basement doors	2 75 each	= 5 50
Total		$652 21
1—20x20 in. ice door	1 00 each	= 1 00
1—18x20 in. clothes chute	1 00 each	= 1 00
DOORS—		
11—2 ft.-6 in.x7 ft.x1¾ in. Red Birch veneered, 3-panel.		
1—2 ft.-8 in.x7 ft.		
1—2 ft.-8 in.x6 ft. 6 in.		
1—3 ft. x7 ft.		
2—2 ft.-6 in.x5 ft.-6 in.		
2—2 ft.-2 in.x7 ft.		
4—2 ft. x6 ft.-6in.		
2 Doors, all veneered	8 00 each	= 176 00
1—3x7 ft.x1¾ in. White Pine front door with 3-6 in. lights at top, 2 panels below		= 5 50
2—3x7 ft. x1¾in. Pine upper part glass	4 50 each	= 9 00
4—2 ft-2 in.x7 ft.x1¾ in. Pine French windows with wood muntins	6 50 each	= 26 00
2—2 ft.-6 in.x6 ft-6 in.x1¾ in. Pine French windows with wood muntins	6 50 each	= 13 00
3—3x7 ft. battened basement doors	2 00 each	= 6 00
2—18x20x1⅜ in. Pine doors	1 00 each	= 2 00
Total		$890 71

160 sq. ft. canvas floor ....$ 0 12	=$ 19 20
Attendance on other trades	12 00
China cabinet material	23 50
Fixing hardware	20 00
Other items	10 00
Labor 50% of lumber bill and mill work	445 35
Grand total	$1421 76

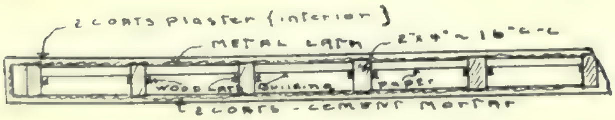
RECAPITULATION—

Excavation, brickwork and cement	$ 613 34
Carpenter and joiner	1421 76
Screens and storm sash	118 20
Hardware	33 00
Hair felt	45 00
Lathing and plastering	490 00
Painting and glazing	283 00
Wiring	77 51
Hot water heating	368 00
Plumbing	255 00
Metal work	84 66
Total	$3781 47

This price does not include drains or septic tank which amounted to $140.00.



TYPICAL ELEVATION



TYPICAL SECTION.

View from corner of Meadway and Hampstead Way
M H Baillie Scott - Archt - Fenlake Manor Bedford

> *"In residential districts one of the greatest difficulties to be contended with is the constant multiplication of buildings too small in scale to produce individually any effect on the road. Every opportunity should be taken to group buildings so that units may be produced of a larger scale".—Unwin's "Town Planning in Practice."*

Conscious City and Town Planning

The Experiment at the Hampstead Garden Suburb

In a previous article the writer introduced this subject in a very general way, and incidentally mentioned his visit to the Hampstead Garden Suburb.

The garden city idea is one that has for several years been attracting considerable attention and with the undoubted success of the propositions at Letchworth, Birkenhead and Hampstead the whole movement has gained a momentum which promises to spread it widely over the country.

Most of the European countries have taken up the problem. Each is working out the details to suit their individual tastes and national tendencies.

The movement is in part the result of modern conditions; overcrowding in the centres of population on the one hand and rapid transit to the suburbs on the other. The trolley and tube railways for the ordinary man and the automobile for the well-to-do has had more to do with this "back to nature" movement than any other cause.

Rapid transit has and will work wonders in methods of living. The Englishman has ever regarded his home as his castle, and a dwelling in the suburbs, among satisfactory conditions, be it ever so humble, is vastly more alluring than the boasted conveniences of a city flat.

This movement to, and building up of the suburbs must be properly organized. The mere accident of owning land next or near to a growing town should not give the owner all the advantages without sharing its responsibilities. This is undoubtedly a free country, but no man should be allowed to lay out his land in such a way as to be a source of needless expense and embarrassment to the growth of the municipality whose very growth renders his property valuable for subdivision purposes.

The ideal condition would be a definite break between town and country. It would do away with that ragged fringe of derelict building land, shacks and rubbish heaps which form the approach to modern towns.

In early days they did this with stone walls for defence. To-day it could be accomplished by broad avenues and walks; the land being purchased before the growth of the town puts a prohibitive valuation on it.

The Hampstead Garden Suburb was the first, and is still the most notable example of town planning, near London, England.

Letchworth was the first venture in England. In an area of nearly 4000 acres the town portion occupies only 1200 acres, including three parks and other open spaces, the remainder of the land being used for agricultural purposes. It is hoped that as in the urban area the problems of slumdom and of haphazard development will be solved, so in the rural portion a practical experiment in the policy of small holdings with a market close at hand will be of public value. In accordance with one of the principles of town planning the factory area was carefully confined from the first to such a position that smoke and fumes would be carried by the prevailing winds away from the residential quarters. Letchworth was entirely apart from any other town, and the experiment could be easily worked out in Canada when our absolutely new town sites are being laid out.

The second venture was the Hampstead Garden Suburb. Here rural conditions did not present themselves. but the aesthetic side has been brought more strongly into light. The conditions are analogous to the various "extensions" of our Canadian cities.

A group of houses designed round a wayside green in Temple Fortune Lane. Note the absence of the untidy back yard. The space usually assigned to these is shared by community in wayside greens and playgrounds.

The suburb is at the terminus of one of London's many tube railways and on the borders of the famous Hampstead Heath, London's largest breathing place. Unlike most extensions it was not laid out by scale and set square, but on the most approved methods of modern town planning, where the individual gives place to the whole. Not only in the bigger houses where the Hampstead Development Company have done remarkable work, but also in the cottage area, mainly the outcome of the labors of the "Copartnership Tenants" has the general effect been studied with the result that the visitor goes away with an entirely new view of the possibilities of town development.

Cottages on Willifield Way. Note the true variety of treatment, the same general design, but a difference in detail on each pair of cottages. The material is stucco over brick.

S. D. Adshead, Professor of Town Planning, in Liverpool University, in speaking of the successes of this experiment where the company not only prepared the plan under expert guidance, subdivide the plot and control architecture, but co-operate in regard to the building, said:

"The noteworthy feature is that while there has been an all-pervading control which has prevented the greater interests of the community being obliterated by the less important, though more assertive interest of the individual, each individual interest has been proportioned to the whole, and individual expression has been given to every building."

The Hampstead Garden Trust worked along scientific, enlightened and unselfish lines.

Enlightened building means the orderly planning of the area on which houses are permitted to be built, instead of leaving certain spaces for sale to private persons, builders and speculators, to be dealt with by them as they mind.

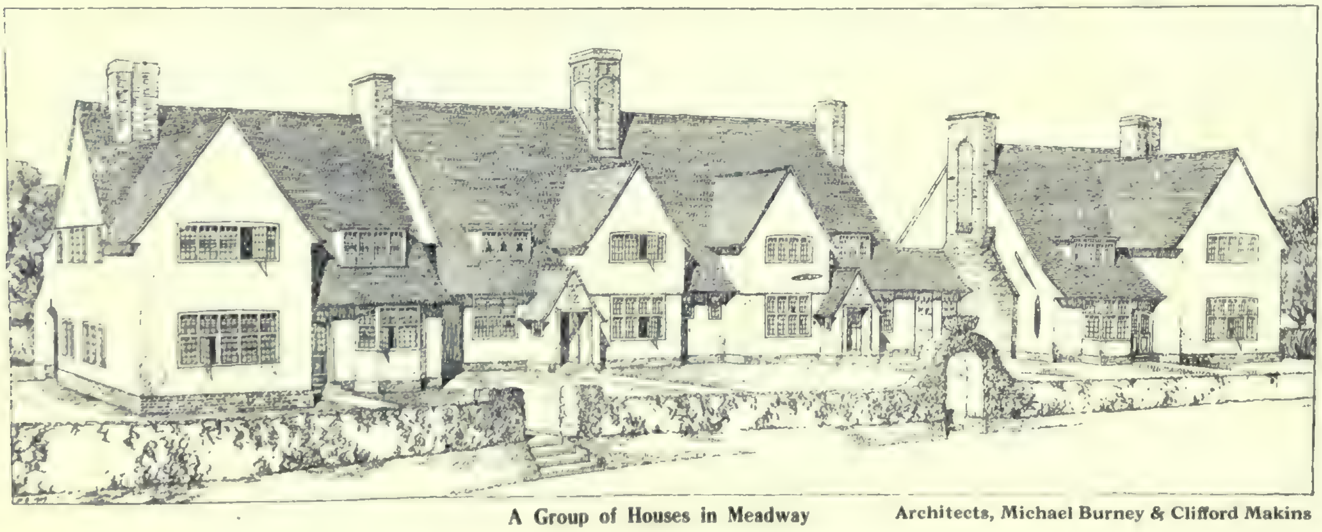
It means also the preservation of every bit of natural beauty the land possesses. All the trees, and the area is rich is them, and, as far as possible, all the fine thorn hedges are to be scrupulously preserved. If the plan does not suit the trees and the hedge, it is a case of so much the worse for the plan, and it is altered.

Again, the land is to be built on but it is not to be built up. A side of each "square" is left open for a satisfying prospect; no planning must leave a house with a view of buildings only; there must be an average of not more than eight houses to the acre.

Mrs. Barnett, The Hon. Alfred Lyttelton, M.P., Sir Robert Hunter (the Chairman of the National Trust for Places of Historic Interest or Natural Beauty), Lord Crewe, The Rt. Hon. Charles Booth, Mr. George Cadbury, Mr. W. H. Lever, M.P., Mr. Henry Vivian, M.P., and the other public-spirited people at the head of the Trust, soon saw that it was necessary not only to promulgate fine ideals, but to get them carried out in practice. So, after their architects, Mr. Barry Parker and Mr. Raymond Unwin (who won their spurs in laying out Letchworth), had planned the new suburb in consultation with Mr. E. L. Lutyens, there was formed a Garden Suburb Development Company, to undertake building on the estate.

The Garden Suburb Development Company has gone to work on lines which seem to be new in the history of estate development. Realizing keenly the difficulties of the intending builder, it has set itself fairly and squarely to meet those difficulties

In the first place, it put itself into communication with men whom it believed to be the best exponents of domestic architecture among the architects of the country. It placed sites before them and asked for the best that they could do in designing houses. Paying the best fees and offering the best facilities for the expression of the architects' ideas There are now in the offices of the company as many as a hundred plans for inspection. It is certain that few intending house-owners can have the opportunity of examining such a selection in the ordinary course. There are many competent architects who are prepared to undertake small houses, but men of reputation and experience charge highly when a client proposes only a small house.



A Group of Houses in Meadway Architects, Michael Burney & Clifford Makins

With regard to the building, the company saw that it could only hope to effect economies by employing a firm accustomed not only to buildong on a large scale, but to getting good work out of its men. The large firms of builders will not tender for one or two houses, and the small builder is out of the question for the reasons which have been stated. The company had the happy idea of asking for tenders on the basis, not of building a house or two, but of $150,000 worth of work. For business on this scale firms of repute are prepared to compete.

I am able to reproduce a list of tenders on a basis of one, ten, twenty or thirty houses.

Tenderer	Cost if one built	Cost if ten			Cost if twenty			Cost if thirty		
	£	£	s.	d.	£	s.	d.	£	s.	d.
W. Moss and Sons	647	614	13	0	608	3	8	601	4	3
Second Tenderer	679	668	16	4	662	0	6	645	1	0
Third Tenderer	684	670	6	6	666	18	0	663	9	7
Fourth Tenderer	705	687	7	6	680	6	6	676	16	0
Fifth Tenderer	710	674	10	0	674	10	0	674	10	0
Sixth Tenderer	742	726	3	3	719	14	9	712	6	6
Seventh Tenderer	850	850	0	0	850	0	0	850	0	0

It is certainly an instructive table. Note not only the difference between the lowest and highest tenderers, but the fact that one firm declined to make any reduction however many houses were given it to build, and another would not build thirty at a cheaper rate than ten.

On the schedule of prices sent in by the firm successful in its tender, all the building it has carried out for the company—and no other has been employed—has been done.

Although it began work in March of 1908 only, the Development Company has spent no less than $7,500 on architects' and surveyors' fees and it has at the time of writing 105 houses erected or in course of construction, and about 90 of them sold and 60 occupied. So greatly have the company's operations been appreciated—several of the houses were sold before a sod was cut—that its capital still stands at quite a nominal figure. The houses sold range in value from $1,750.00 to $17,500.00.

It is unnecessary to use space in speaking in detail of the houses which adorn this novel suburb. It need only be said that the impression made by the suburb is something different from what is received elsewhere. The site is naturally attractive, and all that has been achieved and aimed at at Bourneville and Letchworth in planning a residential district for people of small means has been vastly improved upon at Hampstead for these and for people who are better off. The houses themselves, among their trees and gardens and open spaces, are an impressive picture of what our towns and cities may one day be when other things are thought of than the highest possible sum in ground rents to be wrung out of a certain area.

Whether the New Hampstead will be so pretty and unusual as to seem artificial is a question which is likely to be asked. So far as the building has gone there can be only one answer, that the place has a particularly home-like look. It seems a restful place. There is a serene atmosphere about it. One recalls the old brick houses of elderly, airy towns like Evesham and the quiet dignified streets one has sauntered through in such places as Haarlem. And the greens, laid out country fashion, the carefully preserved oaks in unexpected positions, the clumps of old thorn, the new hedges of privet, sweet briar, yew, holly and wild rose, intermingled with honeysuckle, jasmine and flowering shrubs, an interesting experiment in place of garden walls, the sunk lawns, the roadside trees, often fruit trees, and, in several places, not in a single row, but several deep, help in the making of the grateful retreat from London's central roar.

But the inside of these houses? Man needs more than views, however charming. Will there be a comfortable place in these architects' living-rooms for a couch of easy dimensions? Will the staircases be negotiable by furniture? Will the bathrooms and breakfast-rooms catch the morning sun and the larders escape it? Is the importance of minimizing servants' labor considered? All that can be said is that the houses visited seemed to answer these questions affirmatively One found in them not only beauty of line and harmony of light and shade, but usually an adequate supply of cupboards in the right positions.

An advantage the house-owner at Hampstead gets is that the Development Company have now a considerable experience of what houses should and should not be, from a practical point of view, and the architects receive the benefits of its criticisms. The builders are also encouraged to make suggestions tending to make the houses the best possible value for the money laid out on them.

View from corner of Meadway and Hampstead Way

Fire-Places for the Modern House

Any reasonable arrangement of flue, back throat and hearth is a fire-place—in the sense of providing a place for a fire; but a real fire-place must be properly designed.

The ambition of the average man is to have a cosy, comfortable home of his own, where he can at the end of the days of labor sit before a blazing fire-place, dream dreams, and weave thoughts inspired by glowing embers, the dancing flames, or the wreathing smoke—an ambition which, if realized, often palls owing to its attendant discomforts and inconveniences. As this is a builders' journal, not a ladies' magazine, we shall dispense with flowery language and descend to the practical.

It is a curious thing, that after three centuries of chimney building, we have yet to learn, as a race, how to construct a fire-place and a flue so that it will do the work expected of it.

Back in the fifteenth and sixteenth centuries our ancestors built their fire-places on the stone floors of the manor halls and let the smoke and gases find their way out the best they could. The experience of a number of house-owners to-day prompts the thought that we might suffer less from smoke if we did it that way to-day. There are fire-places that do not smoke, of course, but a number of them work in spite of their designers, not because of them.

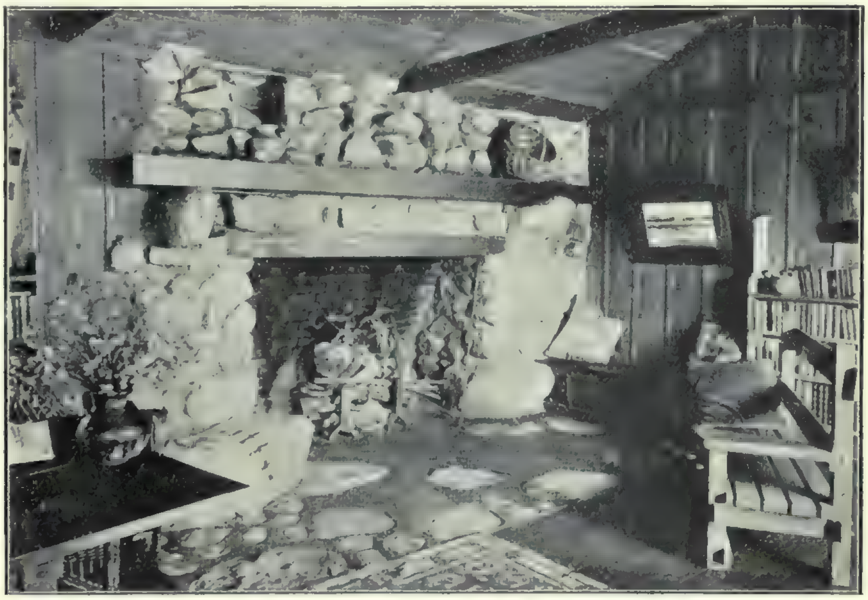


Fig. 1 - Fire-place of Field Stone suitable for Summer Bungalows.

It is an easy trick to make a fire-place draw; simply make the flue large enough and it will draw not only the fire, but everything else up the chimney. This is the kind our Colonial ancestors built. On a cold night they blistered their toes before the mighty blaze and developed rheumatism and influenza through the mighty wind that rushed by them on its way up the chimney. Ninety per cent. of the heat went up the chimney. This is the ideal fire-place for the summer bungaloww, here good cheer, not heat, should radiate and cordwood may be had for the cutting.

True, any reasonable arrangement of flue, backthroat and hearth is a fire-place—in the sense of providing a place for a fire—but a real fire-place must be designed with care both from the practical and architectural standpoints. If we are to design our fire-places for real comfort and enjoyment we must give up this almost universal desire for a big fire-place. I have yet to find the man about to build, who does not ask for "one of those fine big fellows." I suppose this is based on the assumption that if a small fire-place is a good thing, a big one is that much better. It is not.

A big fire-place is too powerful a ventilator for the ordinary living rooms of to-day; it needs air—a great quantity of it—and the fire will draw it into the room through every crack and crevice of doors and windows to feed the flames This means draughts, and draughts spell illness. So the maximum size of the ordinary fire-place should be about three feet wide and two and a half feet high. It is possible to construct such a fire-place along scientifically correct lines so that it will not smoke and will produce the maximum heat with the minimum consumption of fuel. In other words, the heat will radiate into the room, not up the chimney.

There are two chief essentials in a good fire-place. One is the relation between the opening into the room and the flue area—the latter should be one-tenth of the former area; the other is what is called the smoke chamber, a part that corresponds to the dome on a fire engine, which is so designed that it takes up and equalizes the force of the steam that is pumped intermittently. In much the same way the smoke chamber takes up the draught and down draught and keeps the smoke going steadily up the chimney. An examination of figure 1 will show this, The brickwork at the top of a fire-place just above the opening is drawn forward to form a "throat"—an opening into the smoke chamber three or four inches deep and the fuel width of the fire-place opening. This throat contains a cast-iron damper

Cuts for 3, 4, 5 and 6 Courtesy Milton Pressed Brick Co.

with a hinge lid as shown. The narrowing of the natural exit passage for the smoke and gases causes these to pass through under pressure and therefore with considerable force. When the fire is first lighted the column of warm air uses at the front of the flue naturally causing a down draught of the cold air at the back. If the way were open to it the descending column would reach the fire and force the smoke and gases into the room. The smoke shelf prevents this and by its shape swirls the cold air around into the path of the ascending warm air until it is heated and passes up the chimney.

This is the simplest and most logical thing in the world, yet if you trust your fire-place to the ordinary mason he will build it in any way but the right one. He will argue with himself, the larger the flue the less likely it is to smoke, with the usual result.

Although the relation between the opening and flue and the construction of the smoke chamber are the prime essentials there are other minor details of the fire-place that must be provided for in order to produce maximum efficiency. The depth of the fire-chamber should be one half the width and the sides and back should slope to reflect the heat out into the room. To secure the proper slope for the sides make the width of the back two-thirds that of the front, letting the sides run back straight for one brick to save bevelling at the front edge. Allow the back to rise perpendicularly about a foot before starting to slope it forward towards the throat.

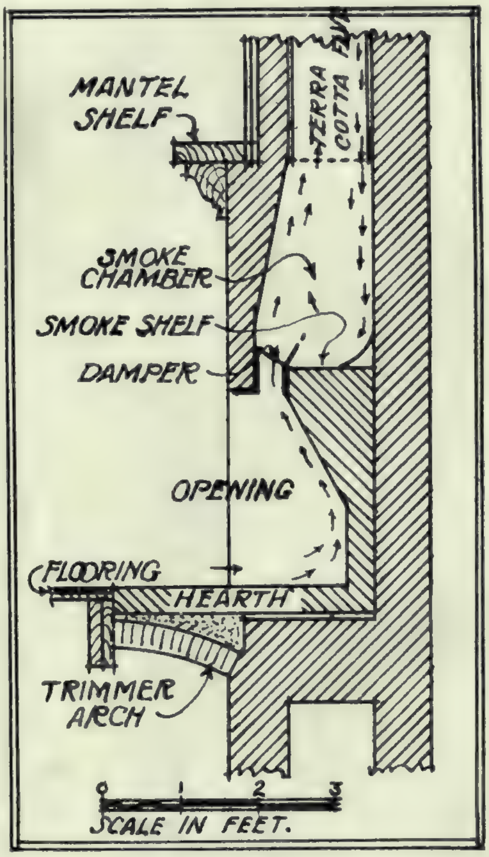


Fig. 2

It is possible to build a fire-place without the iron damper, but its presence is a guarantee that the form and size of the throat will be correct. Then, too, its front ledge supports the flat arch brick of the front which without it would require an iron angle bar.

See that the opening into the flue proper, which latter is best lined with terra cotta forms made for the purpose, is over the centre of the fire-place, in order to insure equal draught throughout the fire-chamber From this central point the flue may swerve to either side to get round the fire-place in the floor above.

Fig. 3

Let the fire-proof hearth extend sixteen or eighteen inches beyond the opening. Its material and pattern is a matter of taste. It is best to support it on a trimmer arch or rowlock arch, as is shown in the diagram. No wonder timbers should run through the masonry under the hearth or close to the fire-chamber. The heat will eventually get to these and set them on fire. The chimney should run a foot or so above any nearby roofridge and if it is properly designed and built it will work without any cowl or whirligig.

Bricks for lining the fire-chamber, hearth and smoke-chamber should be hard burned and laid in the best cement mortar. Ordinary lime mortar will not withstand the heat of these exposed locations.

In the case of fire-places for wood consumption it is a mistake to have an ash drop in the hearth. The presence of a glowing mass of embers under and back of the blaze is one of the wood fire's greatest charms. Bury the unconsumed wood each night under the ashes and it will furnish the best kind starter for the next evening's fire.

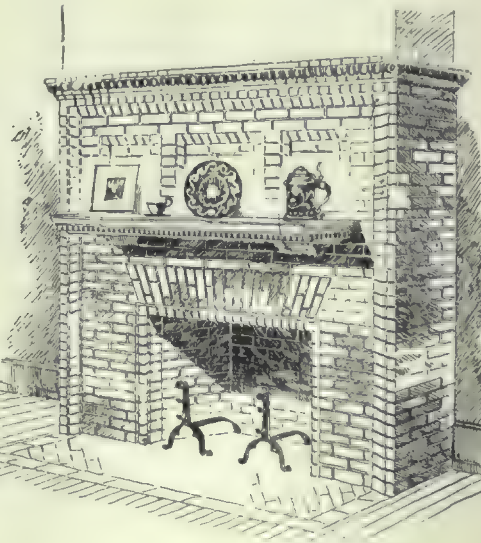


Fig. 4

There is an infinite variety of mantles to decorate and embellish the chimney breast, but this is a question for future treatment. Suffice it to say that in the living room the fire-place should be the central architectural feature, around which all else is grouped and towards which all controllable perspective should focus. The character of the room should control the selection of the style of the fire-place, for no matter how often the decoration of the room is changed it must always take its key from the fire-place. Thus a fire-place that looks stingy or cheap will entirely kill the effects of even quite expensive and tasteful wall decoration. The fire-place is par excellence a place to avoid bad taste—a difficulty not easy to avoid with so many bad examples in the market. Avoid the bizarre and gaudy or it will ruin the restful home-like effect you are striving for. In a big room meant for a general living room it is always safe to have a rather low and broad fire-place. The architectural effect can be gained and still preserve proper size of grate and throat.

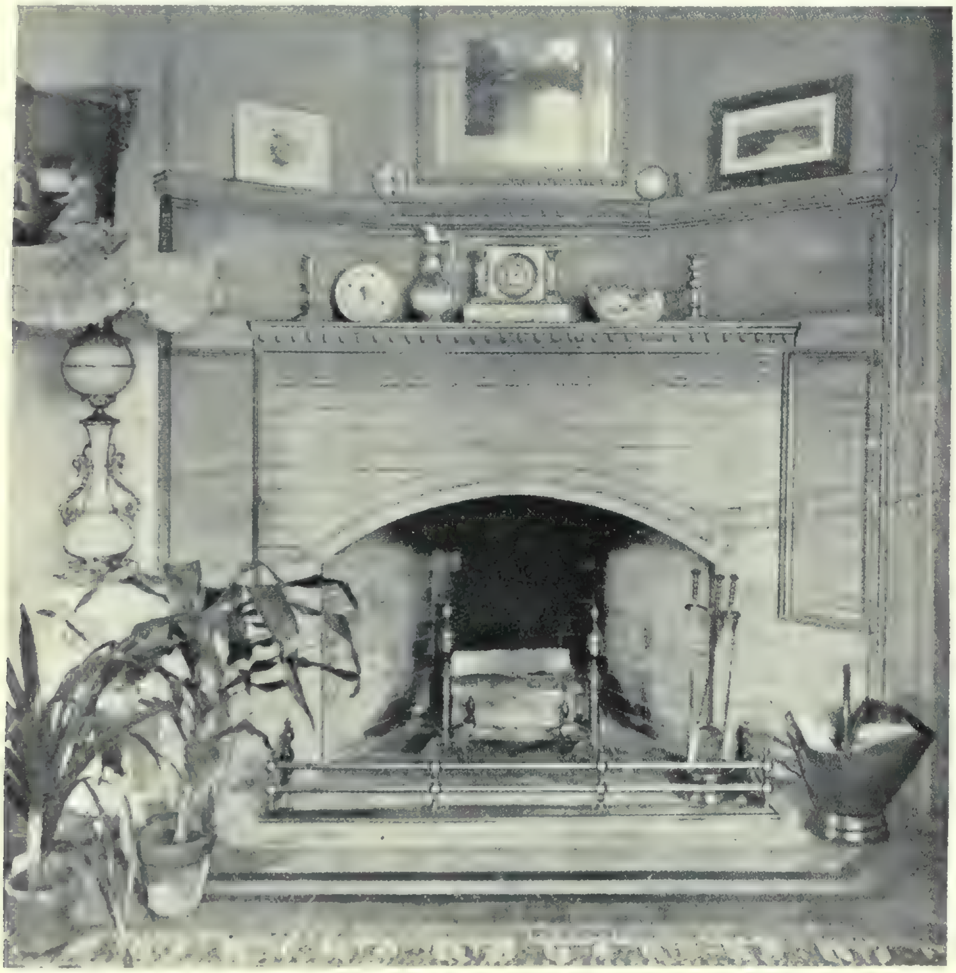


Plate No. 5. Bricked Fire-Place Stocked by Milton Pressed Brick Co.

Brick or soft matte tile is the most satisfactory material in most cases, unless the room will carry a fire-place of field stone or rubble. For instance, in the general assembly room of a bungalow the field stone is ideal with its sense of informality and out-of-doorness.

Fire-place hoods are growing more popular, and an attractive hood very often adds unmeasurably to the appearance of the design. They are executed in all sorts of metal, copper or brass of course being most frequently used.

The tendency to-day towards the use of cement as a constructive material has to some extent influenced the design of both the fire-place and the house.

All things considered, the best effects are obtained from brick. It is by no means necessary to stick to this material, but it is easier and more appropriate to build a fire-place of the size considered with the small brick. If considered necessary, however, tiles may be used to excellent effect—not the highly glazed raw colored tiles, but dull hand-made tiles that show something of the fire that made them. They are set in cement against the brick work.

Some of the more enterprising brick manufacturers sell fire-places of various designs ready for setting-up. We are indebted to the Milton Pressed Brick Co. for a few of the illustrations submitted.

So far we have considered the fire-place with wood consumption in view. In England where the fire-place is practically depended upon for heating the houses, coal grates have reached a state of perfection not yet attained in America. This is not to be wondered at, for while we have been developing the range, the furnace, and hot water heating, they were developing the coal grate and fire-place. This, however, is a subject for a future article.

Economizing Time in Building Work

The Subject Under Consideration is not Exactly "Speeding Up" but it is Rather in the Nature of Better Methods, or Improved Organization

By improved organization can a few seconds of time be saved in the laying of a brick? This is a problem to which an American engineer has recently devoted considerable time and study.

A million of bricks is a commonplace number nowadays on a building. A second saved in the laying of each of a million of bricks is 277 hours, and 277 hours at 50c per hour is $137.50 Two seconds equals $277.00, three seconds $12.50 and five seconds $687.50. If your building is one of two million bricks and five seconds can be saved on each brick, this means a saving of $1375.00.—a profit of over $26.44 a week for twelve months. Most of us know what "speeding up," or "hustling" in the American building trade mean. We also know the results on both the work and the men, and we condemn it accordingly.

Fig. 6—Side-wall Fire-Place for Living-Room.

The subject under consideration is not exactly "speeding up," but is rather in the nature of better methods, or improved organization in the better sense of the term, and as such is worthy of study.

Bricklayers at work are spaced along a wall at intervals of from 6 ft. to 10 ft., a few bricks to the left and a mortar-board to the right hand of each man.

Bending, and with a half-turn to the left, each man grasps a brick from the scaffold floor, comes erect, and, with a half-turn to face the wall again, butters the end of the brick, lays it, taps it home, and rakes up the mortar on the end ready for the next brick. At four or five brick intervals he repeats the bending and takes up one or more large trowelfuls of mortar and spreads it along the wall in anticipation of the next brick to be laid. He saves time by these methods compared with what he would do if he laid mortar on the bed and joint by a separate movement for each brick. This is one of our fairly-well organized buildings. But how much more often one sees the mortar-board placed *behind* the man, necessitating a complete full turn, the bricks scattered and also placed behind him, requiring another full turn, both of them flat down on the scaffold floor, causing him to bend to the fullest extent, and then raise both himself and the brick to breast height before he lays it. Then, again, one observes a mortar-board serving two men, and each has to take one or two steps in addition to the bending and turning every time a brick is laid. The value of the time spent in these unnecessary movements is very much greater than that spent in the actual laying of the brick. This is where the seconds go, and where a little thoughtful manipulation of materials and scaffold will effect the economy.

Apart from the loss of time there is also a loss of wasted energy to the workman, which, though little in itself, tells considerably in the aggregate result.

Mr. F. B. Gilbreth, engineer and contractor, New York, has been making a study of these movements, and he considers he has found a method by which most of the time that is now lost can be saved. His observations are published in the July number of ***Industrial Engineering*** (New York). They are well worth a little careful thought, and the field for their application is wide:—

"Laying bricks on a wall from a floor, from the height of the floor level up to 3 ft. 8 in. high, can be done with greatest speed when the bricks are maintained at a height of 1 ft. 3 in. plus two-thirds the height that the wall is higher than the level of the floor on which the bricklayer stands. The brick should never be higher than 3 ft. 8 in. under any circumstances.

By maintaining the height of the brick in this relative position to the height of the wall, the brick will always be in a position that permits the bricklayer to accelerate the speed of transportation of the brick by using the path of the quickest speed. While bricklayers know nothing about this in theory, they very soon discover it in practice. Greater outputs will soon be noticeable as an immediate result of maintaining the bricks as nearly as possible at the heights above stated."

For the information of those who are not sufficiently familiar with building practice it may be stated that the bricklayer does not regulate the respective heights of the scaffold at its varying stages, nor does he have anything to do with the disposition of the bricks, mortar. or other materials on the scaffold. This is all done for him by labourers acting under the foreman's instructions. The bricklayer takes the materials as he finds them, and his work consists solely in laying bricks.

One frequently notices the bricklayer reaching up to a height of 5 ft. or bending down to the level of his feet, when laying bricks. In either position an inevitable waste of time and energy is taking place, but this is not his fault; the error is that of the management or organization, in which the bricklayer takes no part.

Mr. Gilbreth, however, finds that the bricklayer frequently errs in making quite unnecessary movements, and more especially in a routine of movements that may have become automatic. and he considers that a considerable saving of time can be effected by having a combination of movements. For instance:—

"The motion used to spread mortar may be combined with the motion used to butter the end of the brick laid just before the mortar was thrown. Thus the two operations may be transformed into one, and a saving of time and motions will result. In fact, so doing may have other distinct advantages, such as leaving better keying for plastering direct upon the wall. This subject of combinations of motions can barely be touched here. Its full treatment involves all other variables, and it can never be considered standardized till each separate motion is a standard.

One can, by a little observation, clearly see that a combined movement will effect a great saving of time in the very numerous and oft-repeated small motions involved in the laying of bricks.

Then, again, sometimes the time consumed in extra movement is worth more than the advantage gained by the movement. For instance, contractors and foremen continually impress on the bricklayer the need to be careful with the expenditure of the mortar. Now, mortar is a comparatively cheap material, and the time spent in trying to economizin its use is time wasted. A bricklayer should never stop to pick up dropped mortar. The mortar dropped is not so valuable as the motions necessary to save it.

Delays due to waiting for materials are outside the study of motions now under consideration, but their effects extend beyond the momentary delay. The effects of starts and stops in the breaking-up of the routine amount to a big consideration, and by minimizing them a big reduction can be made in time-saving. The elimination of unnecessary distances, making motions as short as possible, all determine the path of economy and increase of output. Broadly speaking, the path most desirable is usually that which permits gravitation to assist in carrying the material to its place.

To anyone who seriously studies the practice of building, these notes will bring a line of thought which is far-reaching, and which, if followed up and the results applied, will mean a considerable saving of time. It may, or it may not, amount to a saving of five seconds on each of two millions of bricks, but it will amount to a useful and not inconsiderable economy. It will apply not only to bricklaying, but to all branches of the building trades where workmen have to perform ordinary tasks, and may waste a second or two each time they drive a nail or cut a stone. The amount is so slight that neither they nor anyone else think of it, yet it may amount to a very considerable fraction of the larger operation and is bound to tell in the total cost.

A PLEA FOR THE SQUARE DEAL.

A prominent contracting decorator whose experience places him in a position to accurately judge conditions, recently informed our representative that one of the most momentous problems that the craft faces to-day as in the past, is the false impression that seems to prevail, even among the better class of house-owners, that the decorative features of homes should cost a comparatively small amount. Take, for example, a house ranging in price anywhere from five to ten thousand dollars. The owner takes it for granted that he will spend a large sum, say, on hardwood floors. The woodwork throughout must be of the best selected timber, but the price is generally a second consideration. He pays almost any price to secure his fancy in expensive furnishings. As for his wall and woodwork decorations—well, here is where he must cut down cost. Not that he is satisfied with inferior work, not that he has not set his mind upon what he wants and how he wants it, but he imagines for some unexplainable reason, that he can get this portion of his work done to his satisfaction at low cost, and he accordingly goes at it with this in view. He forgets that good decoration entails big expense; that experts in this line, as in all others, are paid large salaries. He accordingly goes down his list of estimates in the attitude of "What's left—for the decorator." By the time he reaches his decorative items, which he places down around the addition line, cost is running high, he sees but one way out; he starts to carve. Who is to be the victim?" It has been the experience of many that this role falls all too often to the decorator.

Interior Finish of Metal

Metallic ceilings and walls will last as long as the building on which they are without any danger of cracking or falling off. G. A. Gordon.

Metallic covering or finish for ceilings and walls is a comparatively new production, having only been in use about twenty-five years. All contractors know that metal has been used to a greater or less extent for a much longer time for interior finish of certain classes of buildings, but the embossed sheets, which are coming so largely into use, are the material referred to as having been in use for about twenty-five years.

Like every new article or line of goods that causes a radical departure from old, and what might be called standard, methods the first output of embossed steel was somewhat crude, but even with the limited variety that was first put on the market there was an immediate demand for the goods. At present the manufacturers of metallic ceiling and wall material are producing thousands of different designs so classified that they can meet the demand for any particular style of decoration or finish, and the goods are made so accurately that a mechanic, who understands his business, can make a perfect job.

Plate No. 418

At first these goods were handled almost exclusively by the metal working trade, and it was only a few years ago that carpenters undertook to erect this material This has resulted in increased sales for metallic ceilings and walls. Manufacturers of these goods make plans showing how each particular plate, piece of moulding, border or cornice is to be applied and they submit blueprints of these plans to the purchaser for the contractor's use. As contracting carpenters are used to working from plans, they have, from the start, been able to erect this class of material without any trouble, and in a first-class manner. The only tool that is needed, which carpenters do not ordinarily carry in their kit, is a pair of tinner's snips, and as a matter of fact this tool is often used by carpenters for other work than erecting metallic ceilings and walls.

Plate No. 819

Regarding the matter of expense, it is true that the initial cost of a great many designs of metallic ceilings, as shown by the manufacturers, is more than for a plain, plastered job, but if you were to compare this first cost of metallic ceilings with an elaborate plaster job, which would have anything like the amount of decoration as shown on the metallic designs, the plaster job would cost many times more than the metal job. In comparing costs of ceilings and walls with other material the facts referred to in the preceding sentence have often not been taken into consideration. Plain jobs of embossed metal are not much, if any, more expensive than plain plaster jobs. For instance, the No. 819 Plate, shown on page 67, can be put on wood strips nailed across the ceiling joists at 14⅜ inch centres with cross strips at the ends of the sheets every 95 inches. Now, any carpenter or contractor can easily estimate on this basis the cost of the wood supports necessary for a ceiling covered with No. 819 Plate. The wood strips are usually made 2 inches wide by ⅞ inch thick, and any carpenter will know what these will cost in his particular vicinity, and he can estimate fairly accurately how much it will cost to nail these strips to the ceiling spaced at the distances specified. This No. 819 Plate sells to the trade at $3.00 per square of one hundred square feet. All metal ceiling and wall material is given one priming coat of white paint before leaving the factory, and one coat of any color after the goods are erected will make a satisfactory finish. The decoration feature is, of course, one that can be carried to any extent, as the embossing on the plates makes it comparatively easy for a decorator to make a very elaborate job, but the more elaborate, the more the job costs.

Plate No. 424

The feature in interior metallic work which attracts the purchaser more than any other, is the lasting quality. Metallic ceilings and walls will last as long as the building in which they are, without any danger of cracking or falling off.

There is no doubt that the demand for these goods will increase more rapidly in the future even than in the past and this means that it behooves the carpenter trade to become proficient on this class of work in order to get their share of the business.

All carpenters and contractors know that when one kind of building material replaces another, such a change is very apt to make a change in the class of workmen. Metallic ceilings and walls replace lath and plaster, and while this means less work for the lathing and plastering trade, it means more work for the trades that erect metal work, and this emphasizes the necessity of carpenters adopting the plan referred to in the preceding paragraph, viz.: to become proficient on this class of work so as to control the trade.

Most contractors know the particular advantages of interior metallic work. The principal advantage has been already stated, viz.: the lasting qualities of metal compared with plaster. Besides this, a metal ceiling often prevents fires. Such a ceiling does not necessarily make a building fireproof, but it will often stop or smother a fire that would spread if the ceiling was of wood, lath or plaster.

Another feature which recommends the use of metal on ceilings and walls is its acoustic properties. Many churches and halls have been improved by its use, and the same thing applies to rooms where musical instruments are kept for sale. Many an old church or hall in which it was almost impossible to hear the speaker has been made satisfactory in this respect by putting in metallic ceilings.

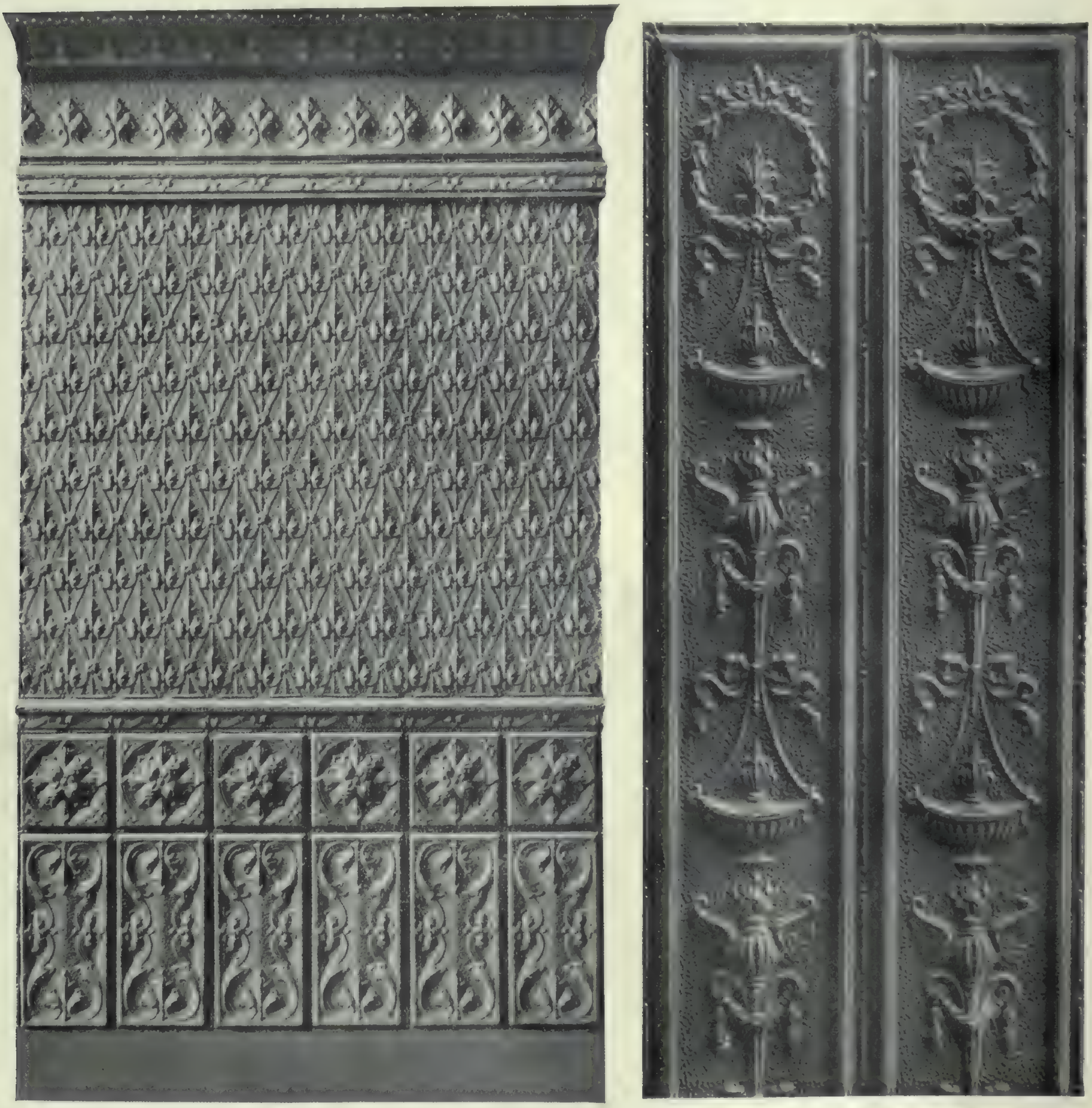
Metallic ceilings and walls are suitable for all kinds of buildings, including private residences. The manufacturers have the designs down so finely that they can suggest designs for private residences that are entirely satisfactory, and all that a contractor has to do is to send the manufacturers the ceiling plan of any ceilings he wishes to cover with metal, and the manufacturers will submit suitable designs with the cost of the same. This also applies to walls.

The time was when almost all metallic ceilings were put on wood strips, but there is quite a general impression among contractors that it is almost as cheap to cover the whole surface with wood sheeting of a cheap variety as to put on strips placed at various centres. The wood, to completely sheet the ceilings, may cost a little more than the strips, but it usually takes longer to place the strips, and the difference in time almost, if not entirely, makes up for the difference in the cost of the material. This applies to the more elaborate ceiling jobs, where ordinary sized plates,

Plate No. 444

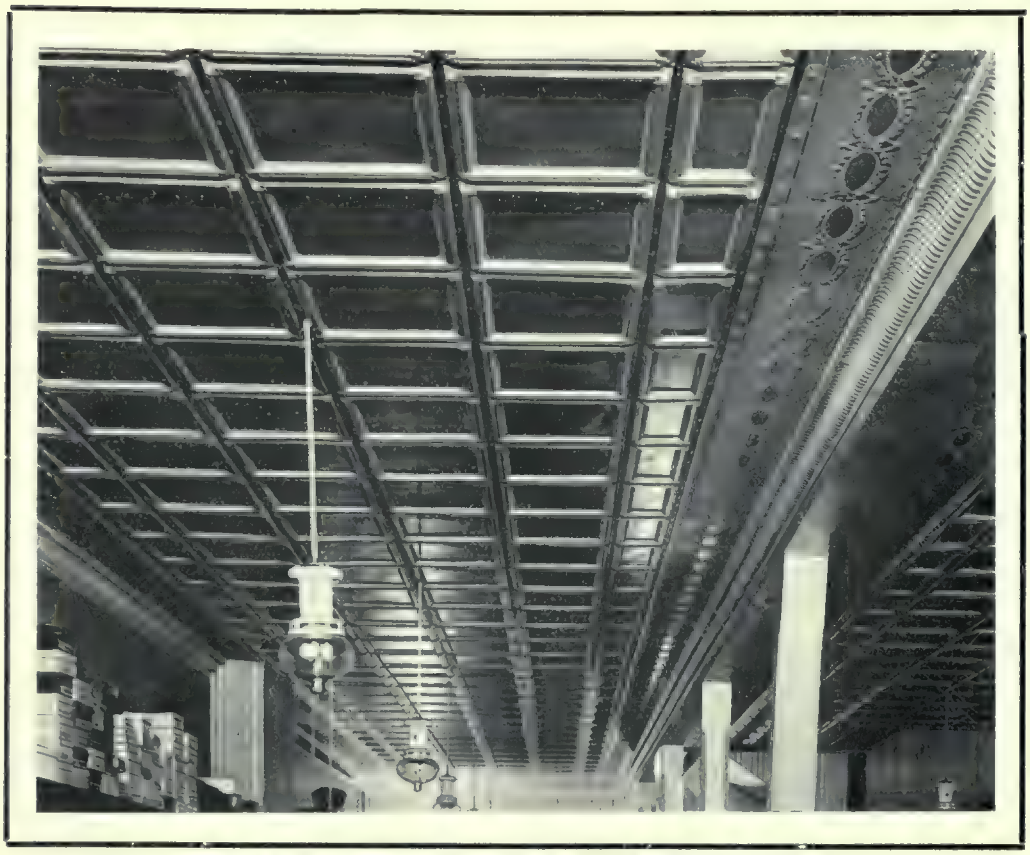
Designs on pages 67 and 68 are submitted by the Metallic Roofing Company of Canada.

such as No. 424 or No. 444, as shown on page 68, and beams cornices, borders and mouldings are used with the plates. When No. 819, or similar plates, are used on the ceilings, without any border, there is no question as to the strips being cheaper than complete sheeting, for there is so little stripping to do with this style of a plate that it reduces the cost very materially. It is well for contracting builders to know that such plates can be secured and put on so cheaply, for it puts them in a position to compete against plastered ceilings.

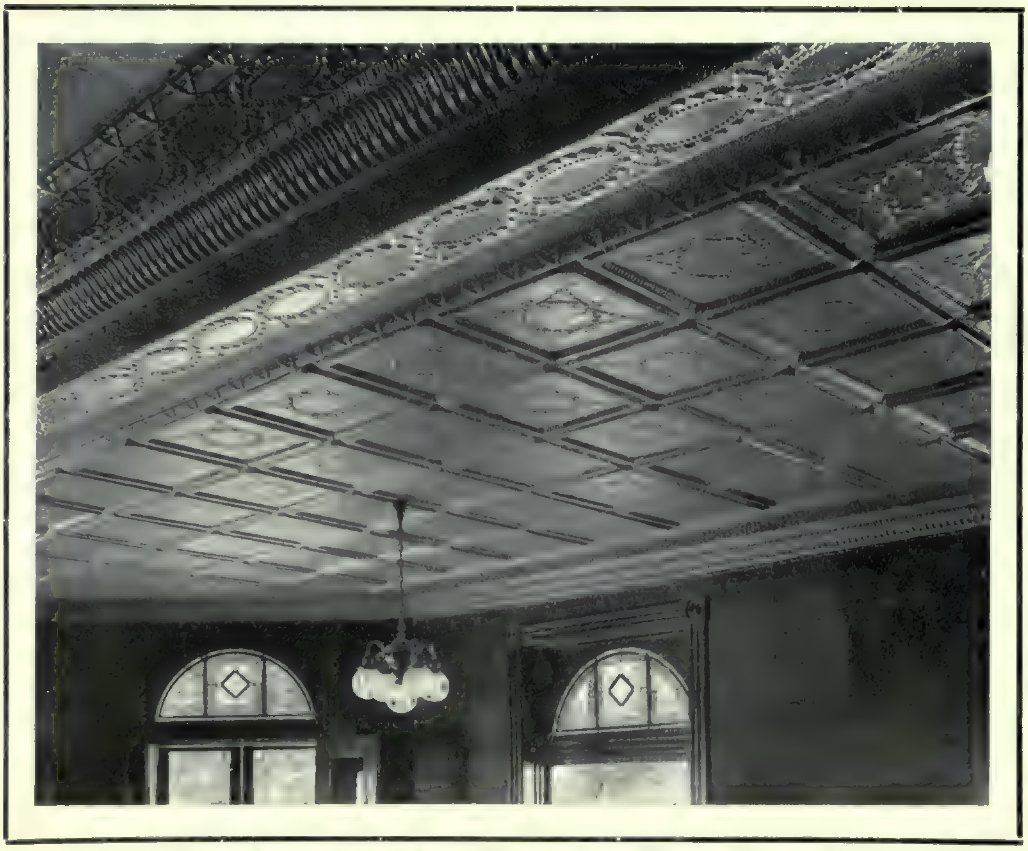


Two Panels submitted by The Pedlar People, Oshawa, Ontario.

It will be seen that interior metallic finish opens up a new field for contracting builders, and one that should be just as profitable to them as any other class of business. This field is now beyond the experimental stage, for there is no doubt that metallic ceilings and walls have come to stay. They now command a very large trade in spite of adverse criticisms from interested parties, and also from parties who were honestly opposed to them. A number of the latter are, however, becoming more in favor of interior metallic finish, for they are rapidly learning that their objections are not valid, and that if there have been any defects in the manufacture, such defects have been overcome.



Colonial Empire Ceiling, Department Store. R. Briscoe, Galt, Ontario.



Colonial Empire Ceiling, Rotunda, Arlington Hotel, Tilsonburg, Ontario.

These illustrate what can be done through intelligent selection of design and material which harmonize with the surroundings, to produce striking effects. The design is one of the many really artistic ones furnished by **The Galt Art Metal Company, Galt, Ontario**

Proper Gas Piping Specifications in Buildings

By Geo. W. Allen, Advertising Manager, Consumers Gas Company of Toronto.

If architects and builders fully realized the importance of proper gas piping installations there would be less cause for complaint among gas consumers about high gas bills. It is a common belief among plumbers, gas-fitters and others that gas companies desire large gas pipes so that the consumer will use more gas. That this calculation is a gross error cannot be disputed. The writer's own experience with the solving of gas account complaints have, in many cases, been traced to faulty piping. I will not go into long technical explanations relative to the reason why large gas pipes save money to the consumer, but will endeavor to explain the reason in as untechnical language as possible, in order to convey the main idea in hand to the reader. All installations for incandescent gas lighting require maximum pressure in order to give maximum service. The large pressure of gas does not necessarily mean a large flow of gas through the burners. But it does mean that if a "pin-head flow" of gas is allowed to enter a Bunsen tube at high pressure, a corresponding high pressure suction is set up with the air in the burner, thereby causing a large inrush of outside air to enter the air mixers and to mix with the gas. The result of this is a uniform mixture, and if ignited will give a maximum amount of heat at the burner. It therefore stands to reason that if the pressure is checked by reason of small pipes the gas valves will have to be opened wide at the burner in order to get a sufficient supply, being a larger volume of gas it therefore has not the same suction pull as the high pressure, and the result will be a reduced heat, thereby delaying work and a consequent high gas bill. The accompanying cut gives a fair idea of the above reasoning.

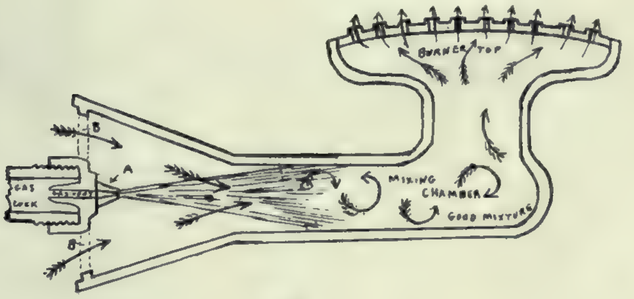


Fig. 1

"A" shows spud or needle point valve with gas entering burners with force. Having plenty of pressure behind it, it has no need of the valve being turned on unnecessarily full. This stream of gas gradually widens until it fills the diameter of the burner tube, and forces the air ahead, consequently drawing in more air to the burner through the air openings marked "B."

The following cut gives a fair idea of a gas supply cut down through small piping.

"B" shows very little air entering the tubes, consequently an imperfect mixture is made, resulting in imperfect combustion and low heating value. Conditions vary in many cases. The ideal way to help remedy gas troubles is to see that proper piping is installed in the first place. The friction in gas pipes grows greater as the pipe sizes are reduced, and, although you can possibly get all the gas you require through it, yet the heating value will be reduced, and if it entails a longer period in which to do the work it necessarily follows that more gas will be used. The writer for some months used a gas range connected to ⅜ piping thirty-five feet long. The result was ample gas for the needs of the home but no pressure. Consequently it took six minutes to boil water, where with the new piping of proper size, three minutes now does. A saving of fifty per cent. on gas bills.

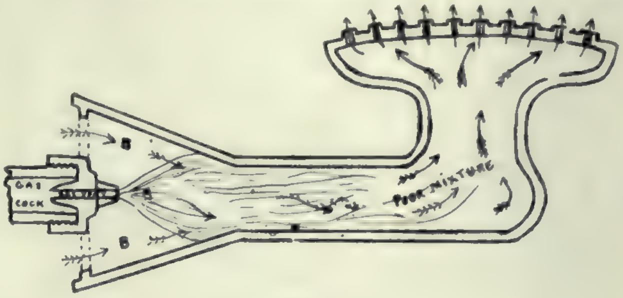


Fig. 2

Incandescent gas lighting is vastly improved by the addition of a trifle more pressure delivered at the burner. The difference in cost is so small between the different pipe sizes that it is hardly worth bothering about, but architects, builders and home owners should see to it that pipes are installed to the following table:

SIZE OF TUBING	GREATEST LENGTH ALLOWED	GREATEST NUMBER OF ⅜ INCH OPENINGS
⅜ inch	20 feet	1 Opening
½ "	30 "	2 "
¾ "	60 "	10 "
1 "	70 "	15 "
1¼ "	100 "	25 "
1½ "	150 "	50 "
2 "	200 "	100 "
2½ "	250 "	200 "
3 "	300 "	350 "

Rising main in no case to be less than ¾-inch.

Pipe supplying stove in no case to be less than ¾-inch.

Pipe supplying gas grates must be ½-inch.

Outlets not to extend more than two inches beyond plaster.

One common cause of trouble is in allowing gas-fitters to place pipes of a size only sufficient for present requirements without any regard for future use whatever. Gas is fast coming to the front, both as an illuminant and for fuel purposes, and ample allowance should be made for such an event. Often it is required to make an upstairs sitting room in a home and if a mantel grate is required the usual practice is to connect it with the nearest gas main. The result is—trouble. After the pipe riser is installed (which, by the way, should be of a size to carry at lease twenty-five per cent. of an overload), the trunk line should be extended from front to rear of the building, all of one size, and off this to install individual branches to their respective outlets—something like the branches of a tree. The writer will endeavor in subsequent issues of this journal to outline the proper gas piping installation which, we hope, will be of value to the reader.

Remarks on Panelling

Hints on Laying out Panels on Walls and Ceilings

Now that panel effects are again becoming popular, perhaps a few remarks on panelling will be appreciated.

There is a right way and a wrong way of doing all things.

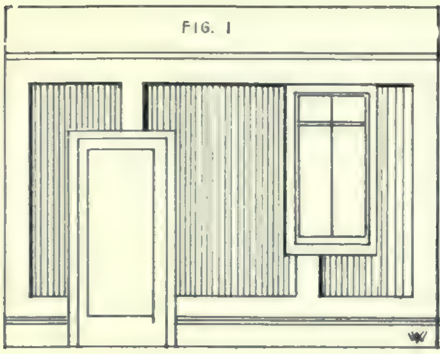


Fig. 1—Correct method of laying out panels to harmonize with fig. 2

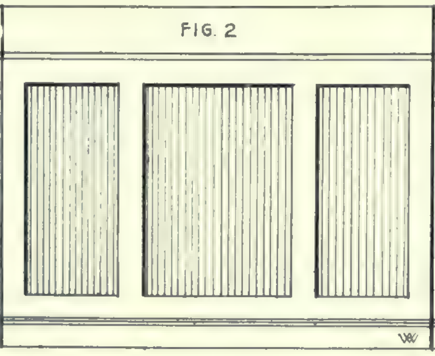


Fig. 2—Sidewall divided into three panels

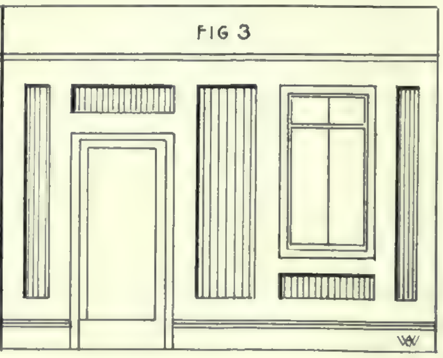


Fig. 3—Method of panelling not recommended

The art of laying out panels on walls and ceilings has not been studied very much by the average painter and paperhanger.

One is forced to this conclusion by the everyday samples of work done.

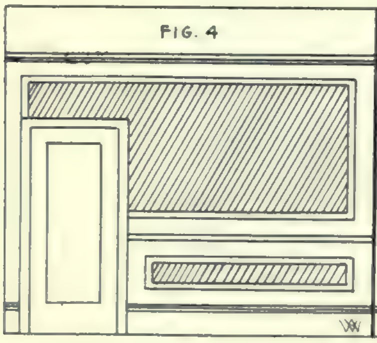


Fig 4—Sidewall of room, use of wide narrow panels to give "length" to a room

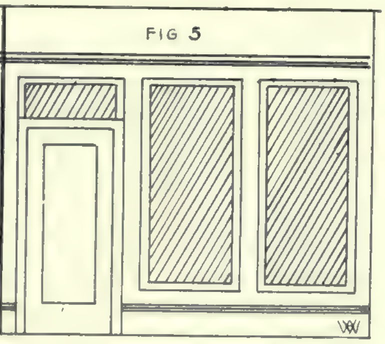


Fig 5—Sidewall of room, use of high, narrow panels to give effect of "height" to a room

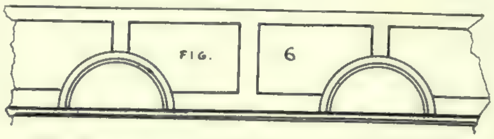


Fig. 6—Panels laid out so as not to interfere with architectural beauty of the arches

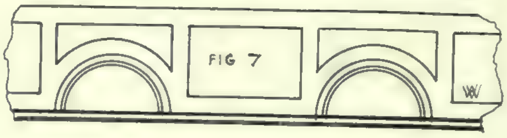


Fig. 7—Wrong method of laying out panels

In laying out panels that are to grace the walls of a room, we ought to first consider the architectural features we wish to emphasize or minimize. If the room is badly proportioned, too narrow for its length, too high for its width and length, or too low, we can, by suitable panelling, do much to rectify the architectural faults.

Rooms having a chimney breast and bay window have a ceiling of irregular shape. This defect can be overcome very readily by forming a panel of the whole ceiling. (See Fig. 8.) It is the rule in laying out a ceiling panel to ignore all projections which cut into the stiles. (The stile is the narrow margin around the panel.)

Don't run the stile around all the jogs. This rule also applies to wall panels. Ignore all doors and windows or any openings in the walls if you cannot bring them into uniformity with the rest of the room. I have illustrated this rule in Figs. 1, 4 and 6. Fig. 2 is the side of a room laid out in three panels. On the opposite side of the room we find a window and door. (Fig. 1.) Now to panel this side of the room in the manner shown in Fig. 3 would be entirely out of harmony and balance with Fig. 2. The more correct method would be to ignore the door and window and lay out the panels exactly the same as the opposite wall, with the result shown in Fig. 1. We then get balance, which we ought to strive for in panel effects.

There is no rule governing the width of stile for any given panel.

The width and height of panels are determined by the size and shape of the room.

Panels long and narrow give height to a low room. (Fig. 5.)

Panels short and wide give length without height. (Fig. 4.) Notice in Fig. 5 that the width of door and casing is taken as the width of panel and that there is no stile immediately above the top of casing, in this

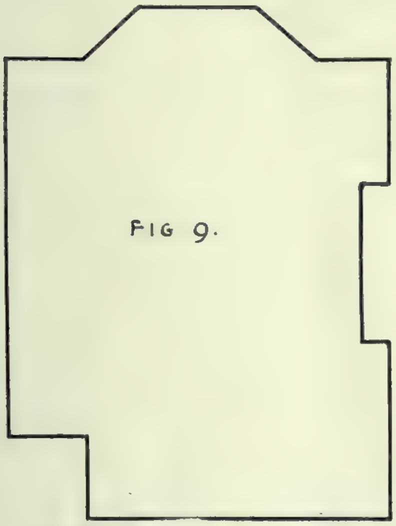
(Registered according to the Copyright Act)

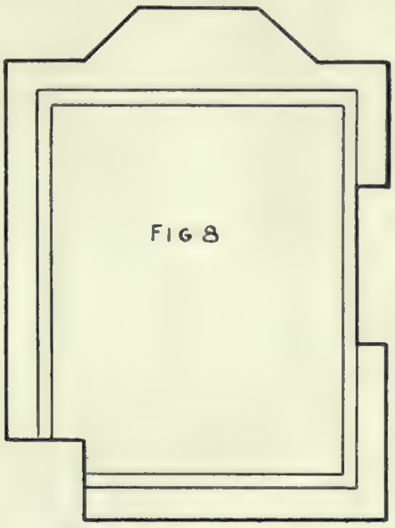
case it would be a mistake to form a small panel over the door as in Fig. 3.

In considering a paper or fabric panel effect in a room where expense is a consideration, make your panels of such a width and height that your paper or fabric will cut up without waste.

You may find it necessary, in order to save waste in watching an expensive paper or fabric, to make the stiles top and bottom much narrower than the stiles at the sides of the panel, or vice versa. This is not detrimental unless carried to excess.

Do not "half" the stile at the corners of a room.





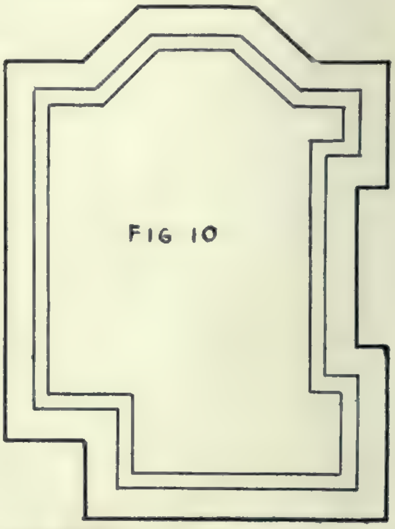


Fig. 8—Plan of irregular shaped ceiling, showing simple treatment of panel to overcome irregularities Fig. 9—Plan of irregular shaped ceiling Fig. 10—Bad method of panelling

If you are using a nine-inch stile, measure off nine inches from the corner each way.

Never take the panel around a corner if it can be avoided.

Make each side of a room as uniform as possible. If the walls run very irregular, with many small jogs and then large spaces, with and without openings, it is a safe plan to make each side of the room into one panel by running the stile along top and bottom and down each corner of the room.

Many irregular shaped panels in the same room are an eyesore.

In laying out panels where you have to contend with arched windows or circular breaks of any kind (see Figs. 6 and 7), the golden rule is to ignore them, unless they are so placed and of such a shape and size as will enable you to make use of them without destroying "balance" or spoiling the architectural beauty.

In Fig. 7 is shown a method of laying out panels, making use of the arch.

In Fig. 6 is shown a method of laying out panels, ignoring the arch.

It will be seen at once that Fig. 6 is better balanced than Fig. 7.

In Fig. 7 the architectural beauty of the arch is destroyed, while in Fig. 6 the architectural beauty is not interfered with.

Turn for a moment to Figs. 8, 9, and 10.

Fig. 9 represents the plan of an irregular shaped ceiling.

Fig. 8 shows a simple method of forming a panel by ignoring all the jogs and projections.

Fig. 10 shows the result of running a border around all the jogs and projections. Result very bad.

In the next issue I propose to deal with methods of laying out panels of an ornamental character, such as "rococo," etc., and will suggest some color schemes for panelling.

PRESERVE YOUR TRADE LITERATURE.

Do you receive regularly all the circulars, catalogues and such literature as is issued by the manufacturers and dealers of the lines you are interested in? Do you save them and file them carefully away, or do you relegate most of them to the scrap heap? Through the medium of trade literature there is within the easy reach of every painter and decorator a most useful and valuable reference library. The description data given in this class of trade literature has been compiled by experts in their respective lines and when vouched for by such men may be relied upon as being authentic. It is usually arranged in a concise form, suitable as a ready reference. Whether you are buying supplies or are looking for helpful suggestions this literature will always be found useful. Give this end of your business systematic attention. This journal is an ardent believer in system in all things; system in conducting this very essential part of your business just as you keep your accounts or arrange your stock-room. In this connection we are at present co-operating with manufacturers and dealers in both Canada and the United States in order to bring our files strictly up-to-date and to make this department of our paper as complete as we can possibly make it. We hope, therefore, to be in a position before our next issue is off the press to furnish any reader with such trade literature as he may require.

A Page of Paint Facts

A Few Brief Pointers of General Interest.

Painting on Brickwork.

If you have a wall of brickwork, and the bricks are very soft, then broom down clean and apply a size of acid water, just enough muriatic acid to cover the water. Let this be rinsed off with clear water, let it dry, then apply all the raw oil the wall will take. This is for a first-class job, and the oil will prevent the chipping of the brick afterwards. The oil makes the soft bricks harder, and also waterproof. Hard bricks will not need so much oil. Where the wall has been filled with raw oil the first coat of paint should be of good quality, and according to what the finish is to be; if to be painted like wood, it should be thinned with oil and turpentine until the last coat, which should be done with all oil. But if a dead brick finish, then use all turpentine color, for the finish, though the priming may be all oil, and the next coat or two, half and half, as the dead effect is surer on a partly lustrous ground, or on a perfectly full luster.

Floor Polishes.

The following formulas are given on the authority of the National Druggist as yielding good floor polishes, which have the added merit of being cheap:

Stearin	100 parts
Yellow beeswax	25 parts
Potassium hydroxide	60 parts
Yellow laundry soap	10 parts

Water and coloring matter are added to suit. Heat altogether until saponification takes place. Another excellent formula is the following:

Beeswax, yellow	25 parts
Yellow laundry soap	6 parts
Glue	12 parts
Soda ash (80°B.)	25 parts

Water and ochre, a sufficient quantity.

Dissolve the soda ash in 400 parts of water; add the wax and boil down to 250 parts, then add the soap. Dissolve the glue in 100 parts of hot water, stir in the ochre and mix with the saponified wax.

The following is recommended for light, unstained parquette floors:

White wax	75 parts
Bleached shellac	75 parts
Clear rosin (transparent)	6 parts
Turpentine	100 parts
Methylated spirit	400 parts

Melt the wax, shellac and rosin together, remove from the fire, let cool down somewhat, and add the turpentine with constant stirring. Warm the alcohol carefully to near the boiling point—this must be done on a water bath—then add to the other mixture with rapid and constant stirring. This preparation should be slightly warmed before applying, and the floor afterward polished with woollen cloths.

Flatting and How To Do It.

We have recently received enquiries from two of our readers asking for information on flatting. There seems to be a little uncertainty among some of our readers on this subject and we accordingly give the following, which has been contributed to this Journal by J. Vaughan Wiggins of Toronto:

To turn out a satisfactory job of flatting there are a few things to remember, which, if neglected, may cause you trouble.

We will take a plastered wall and ceiling as an example.

You cannot do a satisfactory job of flatting unless you stop all suction in the plaster.

The walls and ceiling will require, at least, three or four coats of oil paint before flatting. The number of undercoats depends upon the porosity of the plaster.

The last coat before flatting ought to dry glossy, without any sunken places where suction has not been stopped, and should not stand too long, nor dry too hard, before flatting.

There are many ways of mixing flatting, there are also many good flat paints, ready mixed, on the market, which can be had from any of the paint manufacturers advertised in this Journal.

Some painters mix flatting in this way.

Take white lead or colors ground in oil as required, thin down to consistency of thick cream with turpentine only.

Do not add any oil ,there is enough oil in the ground oil colors to bind it. To stop the turps from evaporating too quickly while applying the flatting, stir a teacupful of water into a can of flatting. It is better to mix the turps and water together first. You will find this mixture work cool (no driers required) Another way to mix flatting is to mix your colors ground in oil with turps as before, then add about a pint of raw linseed oil (not boiled oil) to a gallon of flatting then add two or three handfuls of whiting and beat all up together well and strain. The whiting will absorb the oil and the paint will dry flat, if enough whiting has been added. (No driers required.)

Do not attempt to apply flatting as you would apply paint.

The proper way to apply flatting is to take a 4-in. flat brush and apply a full coat quickly, with as little effort as possible to cover the surface, then stipple it.

Do not try to spread the flatting even or lay it off, the stippler will do all that.

Hot Air in House Heating

The Heating of the Home is a Something That Gets Much Less Attention Than it Should

Heating a home is an item to which little thought is given by the average homebuilder, says Arthur C. Clausen, architect, of Minneapolis, with the result that he has less practical knowledge on this subject than on anything else which enters into the construction of his home.

While a poor plumbing job is a great annoyance and expense, from the constant repairs required, it presents but little inconvenience as compared with a poor heating job.

A heating plant is usually installed during the summer months, and the heating contractor receives his pay before it is possible to give it a practical test. If he is not an honest man, he could easily cut down on the required amount of radiation both on the size of the radiators and the size of the boiler, and the fact would not be apparent until later on in the winter. His usual excuse at that time would be that the house is either poorly constructed or that the owner does not know now to run his heating plant. Some times the last excuse is justified for it makes a great deal of difference as to how a plant is run.

Most any kind of a heating plant will heat a home if the boiler is crowded, and given constant attention, but this should not be necessary. A little coal thrown on in the morning and night, with one light shaking each day and a thorough shaking down once a week, is all the attention that a properly-installed heating plant should require.

In a mild climate, having little cold weather to contend with, a hot air heating plant gives very good service, provided that the house is not too large and that the furnace can be centrally located, giving short runs in the basement from the furnace to the perpendicular pipes.

In heating a home by furnace, the heat should be carried by the very shortest route from the furnace to the rooms, this being somewhat contrary to the plan adopted for the hot water or steam plant, the radiators being placed on the outside walls if possible.

Hot air registers should be placed either in the floor or just above the baseboard in the partition, the later method is far more practical and sanitary. When the registers are not in the partition the sweepings of the whole summer gradually sift through, then into the air, blown back germ-laden during the winter.

A hot air plant has one advantage over all other heating plants. A little paper and kindling thrown into the furnace at any time will create heat enough in a few minutes for one or two rooms. This proves quite convenient during the spring and fall, when it is not necessary to keep the plant going for the whole house.

All tin pipes should be covered with asbestos paper, both in the basement and in the partition.

When a hot air plant does not heat properly it is usually due to one or a combination of three causes: insufficient radiation for registers or furnace; too long a horizontal run from some of the pipes in the basement; too many bends in the pipes. Of these three causes insufficient capacity of the furnace is the most common.

If the furnace is a good-sized one with a large firepot, on which a steady globe of hot coals can be kept, after the proper arrangement of the drafts has been learned by experience, the furnace will, in most cases, overcome any other mechanical defects.

When hot air is forced into a room, there must be some outlet for its escape. This is accomplished with a hot air heating plant by what is known as a cold air return. A large register is placed near the front door, which takes off the cold or dead air on the floor, carries it down by natural circulation through a pipe down the outside wall in the basement, under the basement floor, it connects with a brick passage which receives the air and carries it to a point under the furnace. In this way a constant circulation of air is provided. A healthier way is to provide a vent exhaust and carry it into the chimney for which an open fire-place with the damper open is a good substitute, and have the air passed up through the furnace from a galvanized iron flue connected with the outdoor air. In this way, fresh, warm air is supplied the house throughout, while the dead and cold air is passed off.

The hot air heating plant is the cheapest that is known, but costs about the same to run as hot water heat. For a small home of six or seven rooms, it can be made to work perfectly.

For a home of seven or ten rooms some difficulties are often encountered, which are sometimes overcome by careful planning.

It is not advisable to put a hot air plant in a house of over ten rooms, unless two furnaces are used.

There are a number of makes of furnaces on the market most of them built on the same principle, but they frequently vary as to quality of materials and workmanship. The proper way to make a selection is to obtain local testimonials direct from the users of satisfactorily working furnaces and make a decision accordingly.

A NEW PLASTER.

Mr. J. L. Anderson, 58 Princess Street, Winnipeg, has after many years of patient experimenting, just succeeded in completing a composition which may revolutionize the plastering trade generally. The invention consists of a material from which partitions and all inside walls can be easily made and put up in blocks of any dimensions, and which can be set firmly together by means of a liquid cement. The liquid will take on paint or any coloring material; it can be sawn through with an ordinary saw, and nails of all descriptions can be driven into it without causing it to crumble or split. The material is also proof against fire, cold and sound, while partitions made of it hardly cost one quarter of the cost of the ordinary lath and plaster work, and any kind of surface can be given it in the mould. It takes only fifteen minutes to make the blocks, including the time they take for drying. Mr. Anderson experimented for a long time in Montreal with his material, but did not succeed until he came to Winnipeg, owing to the fact that the materials for the manufacturing of the blocks could only be found in the neighborhood of this city. The inventer has applied for American and Canadian patents covering both composition and machinery. He gives twenty-five reasons why the "Canadian blocks," as he calls the material, are the best in existence for partitions and walls.

The Waterproofing of Structures

Brick, which is Exceptionally Porous, is Seldom Encountered in Large Structures where the Waterproofing Problem Assumes Distinct Magnitude.

With the recent rapid advance in building methods, and the growing values of sub-level spaces in large communities, the problem of securing absolute freedom from moisture within such structures has become serious and increasingly difficult of solution. At a depth of 30 to 40 feet water pressures may rise to over a ton per square foot of surface

So far as the stability of the structure itself is concerned such pressures are easily resisted by the thickness of the walls necessary to support the superstructure and withstand the lateral pressure of the earth.

But to prevent the entrance of water is a far more difficult problem. In fact the successful construction of a substructure in any way exposed to external water ultimately depends upon the perfection of the water-proofing method employed. All structural materials used for foundations or similar purposes are of necessity hard, rigid and inelastic. Though more or less impervious through their substance, they usually present opportunity for passage of water at their joints, or through cracks which, because of their inelastic nature, are almost certain to develop.

Brick, which is exceptionally porous, is seldom encountered in large structures where the waterproofing problem assumes distinct magnitude. Broken or cut stone which formerly prevailed as a substructural material, presents in the completed wall no end of possibilities for inward leakage at the multitudinous joints. But concrete has now become so universal as a foundation building material that all others are of secondary importance.

If concrete were a homogeneous material, always of the same composition and characteristics throughout, the question of its permeability might be readily and conclusively settled. But composed as it is of various aggregates—cement, sand and gravel or broken stone—each differing greatly in its individual quality, mixed in a wide range of proportions, and with varying degrees of thoroughness, concrete becomes merely a generic name. While it may be possible to render a small mass of concrete entirely impervious to water, it is still an open question whether a multitude of such small masses may be so united that the entire body will always be impermeable.

To secure impermeability, every particle of sand must be coated with cement and every particle of stone must be so surrounded with this cement and sand that the stones and the sand grains do not come in actual contact but are always separated by films of cement which completely fill all voids.

Although the quality of the work may be improved, there still remains the possibility of imperfection. It is this possibility always present in such construction which, aside from other causes, renders imperative the employment of independent means for absolutely insuring the impermeability of the entire structure. In a general way it has been determined that the permeability of concrete diminishes as the proportion of cement is increased. When the composition itself is varied a wide variation in water-tightness is usually the result.

What is true of composition is likewise true of thickness. Because of variations in proportions and methods of laying it is impossible to specify definite thicknesses of concrete to prevent percolation under different heads of water. Rain water under a head of two or three inches has been known to percolate through a four-foot wall of excellent concrete and dry consistency, while a three-inch wall under four feet head of water has proven perfectly tight. These facts only emphasize the uncertainties prevailing in so-called watertight concrete construction.

Continuous tests have shown that ordinary seepage through concrete usually decreases with time. This has been attributed to the gradual stopping of the pores by the carbonates of lime which result from the attack of the cement by the lime-carrying water passing through it and its subsequent exposure to the atmosphere. These efflorescences tend to solidify the mortar and form an outer coating, and are the material cause of the gradual decrease in percolation of water. It is but natural therefore that hydrate of lime should be suggested as an ingredient of the concrete to be introduced at the time of mixing. This, like many other materials, such as sulphate of alumina, soap, alum, or metallic stearates has been made the basis of compounds designed to be incorporated with the concrete for making it watertight. These act in various ways, and in the case of many so-called waterproof compounds of unspecified composition put together without regard to chemical principles, the effect upon the endurance of the concrete is absolutely unknown. In some cases they have been found to contain a large proportion of inert substances which interfere with the nominal setting of the concrete and materially decrease its strength while exerting a negative influence upon its permeability.

The absolute permeability of the material of the structure may count for little in its ultimate ability to prevent the admission of water from the surrounding soil. Being of necessity an inelastic material, ruptures in the form of minute cracks or more clearly defined crevices are always liable to occur under strains induced by temperature changes, settlement, warping, etc. The elasticity of concrete, such as it is, varies with its composition and the size of the stone But in no sense can concrete be considered an elastic material. Its coefficient of expansion per degree Fahr. ranges from 0.000005 to 0.000008, according to the mixture.

In larger structures, iron or steel reinforcement will insure general provision for expansion and contraction through cracks confined by the construction to certain definite places. But imperfections are still possible in the balance of the work. The cracks may be treated as joints to be made watertight by special means, with the possibility, however, of ultimate leakage if the material employed is directly and rigidly attached to the concrete on either side and obliged to move with it.

The method whereby it is undertaken to render concrete impervious by the introduction of an ingredient is manifestly so simple that had it proven as economical, practical and effective for substructural as for superstructural work there would be no reason for the consideration of any other methods.

Surface coatings are as old as concrete itself. For centuries neat cement has been used in the form of a wash or a trowelled grout. Under the conditions previously prevailing, where great depth of substructure did not exist and abso-

Abstracted from a treatise on "Waterproofing" published by J. A. and W. Bond & Co., Boston, Mass., and Hamilton, Ont.

lute impermeability was not necessary, such simple means have appeared sufficient. In similar manner asphalt or coal-tar pitch has been applied hot as protection against the passage of water. For years Sylvester's solution of alum and soap had been applied in many coats with varying success. Concrete surfaces have been impregnated with paraffine, paint in a hundred forms has been used, enamels and the like have been brought to notice. It is eminently logical that any protection, whether applied directly to the surface or merely enveloping it should be upon the water side and that it should serve to prevent contact of water with that surface. Once admitted to contact with the concrete the water will search out and follow every channel, no matter how minute, that leads through its substance. Under the ordinary conditions of construction the application of any coating direct to the outside of a completed wall of a substructure entails the excavation of an external area sufficient for working space. The cost of such excavation aside from other considerations is alone sufficient reason for considering such a method impracticable, particularly at any great depth.

It is but natural that because of the ease of application coatings should be tried upon the inner rather than the outer surfaces of structures below ground level. But this always leaves water free to exert its pressure to push off the coating rather than bind it faster to the surface as would be the case it if was applied upom the outside.

The only possibility of opposing a reasonably effective stop to the water by an inside application lies in making it of ample thickness and bonding it effectually to the existing concrete. Waterproofing cement in various forms has been tried under these conditions. In one of the most successful forms it combines with the good qualities of a first-class Portland cement the power of repelling water. It is usually applied in a coating about five-eighths of an inch thick, but requires a special sand for its mixing and especially skilled labor in its manipulation. Its success depends primarily upon its adherence to the wall, but being deficient in elasticity the shrinkage cracks on reinforced concrete are sufficiently large to fracture the coating and render it of questionable value.

From this somewhat critical discussion of waterproofing methods it is clearly manifest that the integrity of any material or method lies not in itself but in the concrete or other structural material with which it is incorporated or to which it is applied.

In the present state of the building art the possibility of imperfection or failure cannot be overlooked, and definite steps must be taken to insure against the effect of its occurrence. Such insurance can take only one practical form, namely, the provision of an exterior pliable waterproof envelope or shield composed of materials unaffected by water, or other matter in the soil, durable under all conditions and free from the influence of movement on the part of the structure itself.

A shield or envelope to fulfill these conditions must consist of more than a mere coating applied to the outer surface of the structural material. No matter how thick an application of asphalt, cement or mastic compound of both materials may be, its resistance to rupture is by no means increased by such thickness. So long as it maintains a bond with the wall to which it is applied, and this is always necessary, it must expand or contract, twist or settle with that wall. Seldom does such a coating have the same elasticity or the same coefficient of expansion as the structure to which it is applied. Hence it may crack even when the wall does not and is practically certain to when it does. In a word, such a surface coating is in no sense a separate envelope, but an integral part of the wall, and hence fails to fulfill the first requirement of the envelope method, *i. e.*, opportunity for independent movement.

In its most practical and economical form such an envelope is composed of a series of layers or plies of a suitable fabric cemented together with a waterproofing compound. Above all the fabric must of itself be waterproof so that each individual layer may serve as a independent barrier to the passage of water, while the intermediate coatings of cementing compound must individually supplement this waterproofing quality and collectively bind the series of plies into a pliable sheet of substantial thickness.

A primary requirement with all waterproofing laid in layers of fabric is that the edges shall overlap so that as sheet after sheet is laid side by side, these laps shall be uniform and the number of thicknesses be the same in all parts. It is also necessary that these sheets as they are successively laid shall be securely cemented to each other, that there shall be no air pockets causing separation of the sheets and no uncoated surfaces, the spaces between which might furnish channels for the passage of water.

Beyond such general requirements for satisfactory work no set specifications can be established. Each class of work requires its own particular treatment as regards material and method of application. The general methods employed with various types of structures may however be briefly considered here.

In "cut and cover" construction where the surface to be waterproofed is exposed during the building process and subsequently covered as in the case of some great tunnel undertaking, the best opportunity is presented for the employment of the envelope method. Here the felt and its intermediate coatings are readily applied to the exterior surface; inspection of the work is simple and reasonably good workmanship is insured.

But where excavation is necessary for the building of the structure which is to be waterproofed the problem becomes more involved. Here the manifold shield must be formed in advance of the construction which it is to envelop. This is usually accomplished by first building against the wall of the excavation a light wall of brick of similar material to which the fabric forming the shield may be applied. When this has been done in a sufficient number of layers in connection with the cementing compound the wall of the structure itself is built. In this manner the envelope is most logically constructed as an enclosure for the structure.

In driven tunnels entirely beneath the surface the waterproofing felt is usually applied to the smoothed walls formed in the process of excavation. Within this core or envelope the finished walls are then built. Manifestly each type of structure requires its special treatment.

The superior advantages of the envelope method having been considered, it is but proper that attention should next be given to the necessary qualities of a waterproofing felt.

Time was when so-called tar paper was the best and in fact practically the only material available for use in the then undeveloped practice of waterproofing by the envelope method. Before the general advent of wood pulp even the paper used for building purposes was of good quality with distinct fiber and reasonable strength. The coal tar used for saturation was likewise of far higher grade than is employed to-day. It is not strange then that work executed years ago with such relatively good materials should, where not exposed to unduly destructive agencies, be now and then found to be in good condition.

But tar paper or coal-tar felt is to-day ordinarily a cheap material of little strength and less endurance under the searching requirements of modern waterproofing construction. The paper is usually of short fiber, hard and brittle. The coal tar used as a saturant has been refined to such a point in order to extract the various products which are more valuable for other purposes, that the coal tar left and used for saturation is practically nothing but a residuum of little value for any purpose.

The gradual reduction in quality of such material, combined with the increasing demand for a fabric eminently suited to modern requirements, has led to the development of various fabrics almost universally called "waterproofed" although possessed of that quality in various degrees. An intermediate stage in this development is marked by the attempt to use a woven fabric like burlap or similar cheap material as a carrier or absorbent for a certain amount of waterproofing compound and as a support or conveyor for applied coatings of cementing compuond.

Fundamentally, the completely vegetable character of such material is objectionable, for it is possessed of little durability when exposed to underground conditions. The fact that it is woven still further contributes to its unworthiness; for, unlike a uniform fabric similar to felt or even paper, its body consists of alternate material and interstices. Upon the compound employed for saturation and coating, therefore, falls the burden of completely closing these spaces, as well as of rendering impervious the actual material of which the fabric is made. What is more, the crossing of the fibers in the warp and woof results in an arrangement which entails a readjustment of relations the moment the fabric is stretched or twisted; a consequent change in shape of the individual interstices takes place. The result is obvious—watertightness cannot be maintained, except at excessive cost.

On the other hand, a material having the characteristics of a felt or paper with the fibers matted together is of the same texture throughout; if made of suitable materials it is always amply pliable. The minute individual fibers, if properly saturated, work almost infinitesimally upon each other when the material is stretched. The saturant itself fills all pores, with the result that the felt retains its waterproof character even when subjected to great strain and distortion.

Waterproofness, pliability and durability are obviously the prime essentials in such a felt. As in all materials, the quality of the finished product depends upon the individual qualities of its ingredients. But the quality of the ingredients, even though of the best, does not alone determine the real value and efficiency of the product when used for a specific purpose. Character and suitability, in view of the conditions, are of equal importance.

Take the case of wool, for instance, as one of the substances incorporated in the felt. Because of its superiority to other available materials, as an absorbent of the saturating compound, wool is invaluable in a waterproofing felt. Its percentage, therefore, determines the possible degree of saturation. A well-made felt is generally most effective as a waterproofing material when it contains the amount of suitable saturant which can be held by an amount of wool equivalent to form a minimum of about 30 per cent. of the weight of the unsaturated fabric. The balance should be made up of such material as will best serve in combination with the wool and the saturant to form the most pliable, durable and waterproof fabric. The saturating and coating compounds should be of a character capable of remaining plastic after long heating at a temperature of at least 250 degrees, and the surface of the felt should not crack when bent double at ordinary temperature.

The saturant employed for such a felt must not only serve specifically as insulation against moisture, but it must remain unaffected by continued contact with water or dampness; even at a high or low temperture it must not deteriorate with age, and must be capable of resisting the chemical action of all ordinary agents which may be found in ground waters, escaping sewerage and the like, and permit the felt to remain permanently pliable. In its best form such a compound should be a combination of gums and mineral non-volatile oils, insoluble in water, and should retain some of the properties formerly found in coal tar, but which are now customarily extracted from it before it is used for saturating the cheaper felts.

A suitable felt should be capable of easy application, and, as a matter of importance, should have a natural affinity for any of the reliable mineral pitches, distillates of straight asphalt or straight coal tar, which may be employed for cementing the sheets of felt together in the process of applying the work. Only in this way may perfect bonding be assured. In the process of saturating, it is customary to also leave upon the felt a distinct waterproof coat. This must be thoroughly pliable, not subject to cracking at low temperatures or liable to become too plastic and adhesive at high temperatures. Under normal conditions it must of necessity be somewhat "tacky." As a result, when felt which is coated upon both sides is rolled in the usual manner for shipment, it is practically impossible to prevent the adhesion of the adjacent coated surfaces except by the expensive method of separating them by the introduction of paper, or by reducing the adhesiveness of one of the surfaces by coating it with some substance such as talc or ground wood pulp. But when sufficient amount is applied to prevent adhesion in the roll the affinity of this coated surface for the hot pitch employed in laying the felt in position is very much lessened.

This practical objection is removed when only one side of the felt is coated. Then only the minutest amount of talc or its equivalent is required to keep the surfaces from adhering in the roll. A quarter of a pound per one hundred square feet is usually sufficient; in fact, the amount is so slight as to be barely perceptible.

But what is more important, it has been conclusively demonstrated by experience that better adhesion on the work is secured between the different plies when only one side is coated. The hot pitch, which in the process of laying is applied to the cement or mortar construction or to the coated side of the felt, is found to adhere in its rapidly cooling condition much more readily to the uncoated surface of a piece of felt pressed against it.

By the omission of one coat, the weight is decreased, while the strength, which is practically unaffected by the extra coat, remains substantially the same. In other words, a thinner, lighter and more pliable felt is secured without impairing its strength, Because of its decreased weight it is easier to handle, and because of the thoroughness of the bond it insures the greatest security against dampness, for when cemented together, with the certainty attendant upon the use of single-coated felt, the mass, consisting of several plies, becomes absolutely homogeneous—an impassable barrier for water. The lightness of this felt materially facilitates its use, for work may be carried on more expeditiously and with greater certainty of satisfactory reasults.

The weight of the reliable wool felt before saturation should be from 5 to 7 pounds per 100 square feet. When saturated and coated one side it should weigh, roughly, from 12 to 14 pounds per 100 square feet, while the weight of a similar area saturated and coated on both sides should range from about 14 to over 16 pounds.

Some Notes on the Identification of Wood

To depend upon the color of wood as the distinguishing mark is to invite error, unless a fresh cut is made deep enough to get under the effect of the persistent action of the sun's rays.

Did you ever think how hard it is to describe a variety or kind of wood without comparison, so that anyone reasonably familiar with the different woods would be able to recognize the kind you had in mind? While it is a fact that some different kinds of wood are so nearly alike as to be substituted successfully, still they have characteristic differences which make them easily distinguishable when the experienced sight, smell or taste put them to the test. But are they differences which can be described verbally? C. Clankey, in *Wood Craft*, gives several valuable hints.

For instance, some certain pieces of yellow pine are so much like other certain pieces of cypress in appearance that but few men are expert enough to be guided by sight alone. Now these woods are not at all alike and, generally speaking, they do not look alike any more than it is a feature common to the two woods to show alternating hard and soft grain. In some soft specimens of cypress, this feature is almost entirely lacking, but in these there would be no room for doubt. In the matter of coloring there is always a characteristic difference between the pine and cypress although it may be very obscure. It consists of a peculiar blending of pink, grey and brown which does not occur in the hard pine. The odor of cypress is marked, especially when burning, while the hard pine does not smell so very much different from any other wood.

Besides cypress, the common woods which have the most pungent odors are black walnut, cedar, Douglas fir, and some of the lesser smellers are cottonwood, basswood, oak, ash, elm, and even hickory. These may all be determined by the odor, but this odor cannot be described by words so that it may become a determining feature of the kind of wood.

With the possible exception of bird's eye maple and quartered oak, there does not occur to me any common wood the description of which would not fit some other as well. I have before me a panel, the two face sides of which are made up respectively of rotary-cut white oak and white ash. There are barely two differing characteristics observable by one not versed in the cellular structure of the wood itself, and one of these regarding color might easily be exchanged in another panel.

The main organic difference is in the fact of the oak having the hard streaks or medullary rays which show up in the quartered product, and in the rotary-cut show the narrow lines representing the edges of the thin slices of harder wood. These do not show very plainly, but nevertheless can be readily seen when looked for. However, there are many other woods besides oak which show these rays, such as the maples, poplars, sycamores (these last being very beautiful in the quartered) and even that beautiful yellow wood commonly called hedge or Osage orange has the flakes in its quarter although they are even smaller than in maple.

To depend upon the color of wood as its distinguishing mark is to invite error, unless a fresh cut is made deep enough to get under the effect of the persistent action of the sun's rays. It is not necessary for a piece of lumber to lie directly in the sunshine—the indirect rays will change its color in time. The change in some woods is very slight, and amounts to little more than weathering, but in others the process is comparatively rapid and the results rather unexpected.

Take a piece of bright yellow poplar of a greenish tinge with an edge of white sap and lay it with surface exposed for three months or more. It will turn as brown as a cypress board and the white sap will be as brown as the darker heart. Mahogany will darken up wonderfully with exposure, while walnut will take on a decided brown.

Red gum loses that lavender tinge which makes it so beautiful when first worked, and takes on a lusterless brown with time. This is the principal reason that it will never become poplar as a cabinet wood in this country only as it is doctored up with some stain. So it will appear that if a description of red gum should be given and the chief characteristics named as a mild purple, pink and brown, with modified streaks of black running through it in fantastic figure, one might say that it was figured red gum. But the same thing is met with in yellow poplar although much more rarely. However, he would be a novice indeed who would mistake a board of figured gum for one of poplar when looking at it. It is a fact, though, that one can find gum boards which have no figure but which are colored very much the same as poplar which has been exposed to the light for a short time.

To attempt to tell the difference between tupelo gum, cottonwood, and basswood by verbal description would be hard enough, but to be able to write a description of any one of the three so that it might not be mistaken for either of the others is an accomplishment which seems hardly possible

A man who was given charge of quite a range of woodwork, once asked the writer how he could tell the difference between red and white oak. Of course the only way was to procure some pieces and point out the characteristic differences, and even then he was not made able to distinguish between the two varieties when the red was rather white and the white rather red. The texture and appearance of the grain ,the open pores and the look of the end of the pieces often have more to do with determining the class than the color alone.

One of the very difficult puzzles in wood craft is to classify very small pieces of wood, say pieces about 1–32 inch thick, ¼inch wide and 1 inch long. I remember having once cut a small piece from the red heart of a white pine knot and

I had the woodworkers guessing what it might be. Everything they could think of from applewood to cherry, by way of cypress, birch and peach, was guessed, while the real thing was passed up on account of its color and texture, but mostly on account of its color. A little nibble would have told that it was a pine. It is altogether likely that a sharp nose would have done the same.

Take a small piece of the hard flake of oak and separate it from the more porous parts and many men of experience will not be able to identify it, even though they cut into it; still, it may be readily placed by chewing it up into a tasty pulp, or by wetting it for a short time and then smelling of it. It is well and commonly known that oak has a very characteristic odor when it is wet or green, but has very little when well seasoned. This accounts for some of the mistakes made by woodworkers taking oak out of the dry-kiln and testing its condition by the odor, thinking it is dry enought to work, when in realiy there is but a portion of the outside parts dry, but which prevents the sap on the inside from reaching the nose of the workman. The only safe test for the centre of the piece is to cut into the board and smell of the middle of it.

It is evident to the experienced man that a correspondence course in wood craft must necessarily be of an abridged character; the latter-day idea is running largely to effects of natural beauty and much less to design; in the patterns of details. What wood can I use to best express the scheme of architecture I wish to employ? How match, blend, diversify, contrast or color it so as to procure the greatest beauty and harmony? One may tell me to use quartered white oak, but if he is writing his advice from a distance he has told me in so many words all that he will be able to convey to my inexperienced mind and the next question as to its cost will receive an answer which the veriest ignoramus cannot fail to comprehend.

If he tells me to use that most beautiful wood known as cypress burl, his powers of description may well quail before the task of telling what may be brought out from under the rough surface of this lumber. Who can faithfully describe the golden mountain chains in miniature which thread through the boards at the middle of the crotch, which, when polished to the limit of 0000 sandpaper, seem to have the sun hiding behind them ready to burst forth into a blaze?

Calgary's Wonderful Building Progress

More Than One Thousand Homes Were Built Last Year.

The value of Calgary's building permits in 1904 was $808,193, and last year $5,589,594. For the past six years the value has been: 1904, $808,193; 1905, $838,829; 1906, $1,097,136; 1907, $2,094,264; 1909, $2,420,450; 1910, $5,589,594. The increase of last year's value over the previous year's was 130 per cent. More than 1,100 private residences were built in the city during 1910, and building was carried on continuously throughout the year. The estimated value of building permits in this progressive city in 1911 is $10,000. Calgary ranked fifth among the cities of Canada in building permits in 1910, and had the highest increase last year of any city in Canada.

Over two and a half million dollars in business blocks of different kinds; half a million in schools, churches, hospitals and kindred institutions; over two and a half millions for home residences, a total of $5,589,594, an increase of 130 per cent. over 1909, is the story told by the records of permits issued by the Calgary building inspector for the year 1910. An estimated amount of $5,000,000 for business blocks, hotels, warehouses, etc.; $500,000 for churches; $500,000 for schools; $500,000 for hotels; over $3,000,000 for private residences, is the outlook for the year 1911, in addition to a proposed expenditure of over $1,500,000 for street improvements and extensions of municipal undertakings.

An increase in 1910 of 130.93 per cent. over 1909; of .555 per cent. over 1908, and of .166 per cent. over 1907, which was the record year up to that time, as a wonderful record of growth and the changes which this makes in the appearance of a young city have to be seen to be realized.

The number of building permits issued during the year was 1,499, almost double the number issued in 1909, which was 777. The number of buildings erected during the year represents a city larger than what Calgary was ten years ago, and larger than any other city in Alberta at the present time, with two, or possibly three, exceptions. The amount of money spent in buildings last year was greater than the total assessment of the city of Calgary five years ago.

In dealing with this gratifying record the "Calgary Albertan" draws attention to the remarkable manner in which building operations were carried on during the whole year, and that the only slackening off was towards the end of December, when frosty weather put a check on building activity, only to be resumed again in a few days, as soon as the weather moderated.

As a matter of fact building operations were carried on all through January, and on January 20 was seen the spectacle of carpenters and bricklayers at work in every part of the city, and work going on with almost the same activity as in midsummer. Where on the continent of America could such a thing be seen? It is not only a tribute to Calgary weather, which permits of such a thing, but of the rush to have buildings completed for occupancy at the earliest possible moment, to meet the urgent demand, and a sign of what will occur during the year.

The figures for each month of the year as compiled by Building Inspector Harrison by months during the year are as follows: January, $106,500; February, $169,800; March, $415,800; April, $603,930; May, $525,066; June, $573,846; July, $520,098; August, $440,988; September, $720,372; October, $568,290; November, $590,604; December, $354,300. It will be noticed that November, during which month building operations are generally supposed to be slackening off, was the largest month in the year with two exceptions. This was due largely to the exceedingly mild weather, which allowed building operations to be carried on continually during the month.

The estimate made by Building Inspector Harrison that the year 1911 will witness a building activity unparalleled in Western Canada, and will double in achievement even that of 1910, is founded on an outlook which he has better opportunities of judging than any other man in the city. If his sanguine predictions are fulfilled it will mean that the Calgary of a year hence will be a much greater and more substantial city than it is to-day.

While the amount of the building permits issued show an amazing progress it does not represent fully the actual amount expended in buildings during the year. In his annual report to the city council each year the building inspector invariably draws attention to the fact that as a fee of $1 per $1,000 of estimate cost of building is charged for the permit (architects and builders generally place the figures at about 25 per cent. less than the actual cost) and that this amount added to the amount for which the permit is granted would represent approximately the actual cost of the buildings. This would bring the amount expended on new buildings in Calgary during the year to over $7,000,000.

Not only has the number of buildings erected during the year increased greatly, but the quality has improved year by year. The enactment of a new building bylaw, with stringent regulations as to the class of buildings to be erected within the different fire limits has had the effect of greatly improving the quality of the buildings over that of former years. The class of buildings now allowed to be erected in the first class fire limits must be equal in structure and material to those of any of the largest cities of Canada. The enforcement of these strict regulations while it may have worked in apparent hardship in isolated cases, has been of great advantage in guaranteeing that no buildings that are not fireproof and of modern design and construction will be allowed in the business section of the city.

While the growth of the city in the way of building has been proportionately along all lines, as would be expected a very large proportion of the buildings erected were private residences. During the year 1,160 permits for dwelling houses were issued, at an estimated cost of $2,315,500, or an average cost of about $2,000 each. The residences varied from the $1,000 cottage home of the workingman to the $20,000 mansion of the wealthy citizen.

One thousand one hundred and sixty added to Calgary's homes in one year tell a story of all human interest. It shows Calgary to be becoming more and more a city of homes as well as a city of wonderful business activity. The best part of the story is that in the great majority of cases the people who have erected these residences built them for the purpose of establishing homes for themselves and families.

The rapid extension of the civic utilities of water, sewer, electric light, street railway, etc., to the outlying sections of the city has enabled men of moderate means and resources to build and own their own homes to an extent which would have been impossible had these extensions not been made. During the year a considerable amount of money was invested in houses for rental purposes, and has proved very profitable, not only in giving a large direct dividend on the cost in the way of rent, but in the increased value of the property, in the way of enhanced realty value.

Miles and miles of streets that two or three years ago were bare prairie are now beautiful residential streets, with attractive and comfortable homes. These are signs of prosperity as evident as the growth of the business section of the city. The people who make up the great proportion of Calgary's residents are here to stay, and the many substantial homes being established is a proof of their permanency.

The other types of buildings which contribute to the returns for 1910 would be creditable to any city in the world. The list includes: 14 business blocks, costing $421,200; 16 warehouse buildings, $362,520; 8 hotels and additions, $429,000; 14 factories and additions, $78,300; 9 terraces and apartments, $255,000; 24 stores, $273,000; 4 garages, $29,160; 3 telephone exchanges, $12,600; 5 churches and additions, $10,200; 4 oil warehouses, $17,200; 5 schools, $123,000; 2 hospitals and additions, $225,000; Y.W.C.A. and Y.M.C.A. additions, $76,000; C.P.R. depot additions and shops, $168,000; departmental store, $60,000; Calgary Power Co., $30,000; Parish hall, Church of Redeemer, $20,000; City power house, $75,000; Mount Royal College, $45,000; livery stable, $20,000; Imperial Bank improvements, $20,000; Carnegie library, $70,000.

The materials available for building purposes in Calgary are especially adapted for the erection of high class buildings, and readily lend themselves to the carrying out of artistic architectural designs.

Calgary sandstone, which has been very largely used in the construction of buildings, is found in abundance in close proximity to the city. It is easily worked, of a beautiful light yellowish gray color, of very fine grained texture and not very friable. Observations of buildings erected fifteen or twenty years ago show that it stands the effects of weather exceedingly well.

This is said to be the age of cement, and this material is becoming more extensively used in the erection of buildings year by year. It is manufactured extensively in Calgary, and the demand for it as a building material has always exceeded the supply.

Brick clay is abundant in the vicinity of the city, and large quantities of brick of excellent quality for building purposes are manufactured at a number of plants. In addition to what are manufactured here, large quantities are shipped in from outside points to supply the demand.

High class lumber for building purposes is also produced in abundance in the mountains to the west and southwest of the city.

Reinforced concrete is rapidly coming to the front as a building material in Calgary, especially for the larger buildings where great strength is required. In future, more of this class of material will be used in the construction of the larger business blocks in the city, in order to comply with the provisions of the building bylaw.

In the building trades at Edmonton, the season must necessarily be an unusually active one, as a very large amount of building is imperatively demanded to provide necessary facilities to handle the rapidly increasing business of the city. Increased warehouse facilities and office accommodations must be provided, and last season's activity in residential must be considerably exceeded to provide accommodation for the increased population rendered necessary by expansion of business.

What New Workman's Law Will Ontario Obtain

The law of Ontario has remained practically unchanged for nearly twenty-five years. In the meantime advanced legislation has been adopted in nearly every other country in the world.

Both the builder and contractor are vitally interested in workmen's compensation, a subject which has received much attention from Canadian legislators during the past few years. It has been announced that the Ontario Government will introduce a new Workmen's Compensation Act, and Sir William Meredith has been appointed a Commissioner to investigate and report as to the form which the proposed legislation should take. The law of Ontario has remained practically unchanged for nearly twenty-five years. In the meantime advanced legislation has been adopted in nearly every other country in the world. There is every probability that the proposed legislation in Ontario will be largely influenced by the course of legislation in other countries.

The matter is important to manufacturers, and the Canadian Manufacturers' Association, therefore have tabulated the following as being among the chief questions to be discussed. They are equally as important to our readers.

1. Whether the right of the workman to compensation should depend upon his ability to prove in an action at law that his injuries were caused by negligence on the part of the employer; or whether, and to what extent, the question of negligence should be eliminated.

2. The question what is the proper amount of compensation, and what the proper basis of fixing the amount in case of injury or death.

3. The devising of some means to prevent money paid by employers by way of compensation from being dissipated in legal expenses.

4. The advisability of retaining the jury system in actions between employers and employees.

5. The question of adopting the principle of "professional risk," that is, the theory that compensation for injuries should be treated as an item in the cost of production and charged against the price paid by the consumer.

6. The question whether the Act should apply equally to all classes of employees, or whether certain classes—as, for instance, agricultural laborers and domestic servants—should be excluded.

7. The question whether the whole burden of compensation should fall upon the employer, or whether a proportion should be borne by the employee.

8. The question of the proportion of burden to be borne respectively by the employer and the employee.

9. The question whether the workman should be at liberty under any circumstances to contract himself out of the benefit of the Act.

10. The question whether the employer should be permitted, or encouraged, or compelled, to insure his portion of the risk of compensation, and by what method. (*See page 15 of pamphlet.*)

11. The question whether any proportion of such insurance payable by the employee should be deducted from the wages of the employee either with or without his consent.

12. The question whether the adoption of some scheme of insurance by the employer should relieve him from liability under the Act.

13. The question whether a scheme of insurance, or the liability under the Act, should relieve the employer from liability for unlimited damages at common law.

14. The question whether gross negligence on the part of the employer should still give a right of action at common law to the employee.

15. The question whether serious and wilful misconduct, disobedience to orders, intoxication, etc., on the part of the employee, should disentitle him to compensation: (*a*) in case of injury, (*b*) in case of death.

16. The question whether accident insurance, or employers' liability insurance, or any other fund or scheme for workmen's compensation, should be under the control of private companies or should be under Government control or administration.

17. The question of the liability of an employer for injuries to workmen employed by a sub-contractor.

18. In general, whether the legislation should be along the lines of the English system of placing the entire burden of insurance upon the employer and leaving him to deal with it as he sees fit, or along the lines of the German system of organizing both employers and employees and creating a fund under joint administration. (*See page 18 of pamphlet.*)

Mr. F. W. Wegenast, secretary of the Ontario parliamentary committee has compiled a pamphlet sketching the present workmen's compensation law in Ontario, and comparing the systems of other countries.

Under the old English common law, he says, as introduced in Ontario, an employer is not liable for damages for injuries sustained by an employee, unless the latter can prove that such injuries were caused by negligence on the part of the employer. If negligence can be proved there is no limit to the amount of damages which can be recovered, that being for a jury to decide, subject to revision by the courts of appeal. The difficulty of recovering damages for injuries to a workman by an ordinary action for negligence is increased by two principles of law which may be set up by the employer by way of defence, viz., "contributory negligence" and "common employment." These two principles are a part of the common law of England and most of the British colonies as well as the United States.

In an action of negligence, the evidence of negligence on the part of the defendant may be met by evidence of negligence on the part of the plaintiff himself which contributed to or was the real cause of the injury. Proof of such contributory negligence will disentitle the plaintiff to any remedy whatever. There is no rule of English law, such as there is in other countries, placing the burden of the accident upon the person *most* at fault or proportioning the amount of damages to the degree of fault.

Where the injury is caused by a fellow-employee the employer is, under the common law, not liable. This is called the theory or doctrine of "common employment." Under this theory the workman who is injured by the negligence of any other person working under the same employer, even though the other person is in a different grade of employment, or is in the position of superintendent or manager, has no claim against the employer. The theory is based upon the presumption that the workman in engaging in any particular class of employment assumes the risks incident to that employment, one of which risks is that of being injured by a fellow-employee.

The difficulties in the way of the plaintiff's success at common law frequently induce juries to strain the facts in favor of the plaintiffs and to exaggerate the amount of damages. This occasions appeals to the higher courts, with the result that much money is wasted in useless litigation with comparatively small practical benefit to the workman. It has been estimated that of the money paid out by employers by way of liability insurance only 25 per cent. actually reaches the injured workman or his dependents.

In Ontario the doctrine of common employment has been partly displaced by the Workmen's Compensation Act of 1885. This Act, with its amendments, gives to workmen in certain industrial occupations, a claim for damages for injuries caused by the negligence of fellow-servants who are in a posintion of superintendence or control, or caused by dangerous machinery, or other dangerous condition of the premises upon which the work is carried on. But the Act leaves intact the doctrine of common employment as to employees of co-ordinate rank; and contributory negligence remains, of course, still a defence.

As an illustration of the working of this present Act, may be cited a case which arose out of the building of the City Hall, Toronto. Two workmen, one older and more experienced than the other, were engaged in hoisting building stone with a derrick. The older man was instructing the younger in the use of the apparatus. The younger man in following these instructions was injured and sued the city. The whole question at issue was whether the older man was in a position of superintendence. It was held that he was not, and the plaintiff failed in his action.

The amount recoverable under the present Act in Ontario is the estimated earnings, during the three years preceding the injury, of a person in the same grade of employment, or the sum of $1,500.00, whichever is larger. Since the Act does not take away the common law right to damages where the workman can prove negligence, it has been the practice for workmen to sue both at common law and under the Workmen's Compensation Act. If the workman is able to succeed at common law he is not limited to the amount of damages fixed by the Act, but may obtain such larger amount as the jury award. If he is not able to prove negligence on the part of the employer he may still be able to succeed under the Act and obtain the limited amount of damages.

The present Act of Ontario was copied from an Act introduced by Mr. Chamberlain in England in 1880. There have since been in England two radical changes in the law. In 1897 a new Act was passed. This Act was intended as an experiment and to remain in force for only seven years; though the time was afterwards extended.

Most of the Provinces of Canada have within recent years passed laws embodying the principle of professional risk. In British Columbia where an Act had been in force similar to the present Act in Ontario, an Act along the lines of the English Act of 1897 was passed in 1902. In Alberta a similar Act was passed in 1908. In New Brunswick in 1908 a modified form of the English Act of 1897 was adopted. In Manitoba during the past session (1910) an Act was passed following the lines of the present English Act, and it is announced that at the coming session of the Legislature of Saskatchewan, a Workmen's Compensation Act will be introduced.

The English system gives rise to ***employers' liability insurance*** for the protection of the employer only. The German system compels ***accident insurance*** to relieve both employer and workman of the risk.

Under the German system the injured workman or the dependents of a workman killed in the course of his employment become pensioners upon a fund; in the English system they become pensioners directly upon the employer unless the latter chooses to commute the periodical payments for a lump sum.

The German system affords facilities for a greater degree of co-operation between employer and workman, with a view to prevention of accidents and minimizing their results. Under the English system it is left entirely to the employer, apart from the Factory Acts to take active measures for prevention of accidents, and the workman is left to his own resources or those of voluntary benefit societies in the matter of treatment of injuries.

The German system *compels* the formation of workmen's benefit societies. The English Act has had the effect of discouraging the formation of such associations.

In the English system in case of accident the employee and employer meet face to face over the question of liability and the amount of damages. In the German system an organized fund intervenes.

The English Act is alleged to have had the effect of inducing a considerable amount of self-inflicted incapacity and malingering. This condition appears to be less prevalent under the German system.

The English Act has given rise to a difficulty in finding employment for aged or partially incapacitated workmen, owing to the effect of such employment upon the rates for employers' liability insurance. Under the German system this condition does not arise.

The German system involves, to a much larger degree than the English the active intervention of the State.

Workmen's Compensation Act For Saskatchewan

A bill of a similar nature to the Workmen's Compensation Act of Manitoba has reached the debate stage in the Saskatchewan legislature. One of the sections of the bill is considered somewhat drastic even by members of the government. It is to the effect that even when a workman through his own negligence or misconduct was the sole cause of the accident, the employer is still held liable. It is probable that the bill will become law, although some of its clauses may be somewhat modified. A deputation from the printers' Board of Trade has lodged an organized protest against the clause described. It is probable that this clause will be amended.

Workmen's Compensation Decision

The Workmen's Compensation for Injuries Act, passed at the last session of the Manitoba Legislature, is invalid unless for "manual" labor, according to a decision handed down by Mr. Justice Metcalfe, at Winnipeg.

The plaintiff in the case was a lady clerk in the Hudson's Bay stores, who claimed damages for injuries arising from slipping on a badly oiled floor. The case was dismissed on the grounds that her duties were not "manual."

THE BUILDER AND CONTRACTOR

Published on the 1st and 15th of every month by

The ACTON PUBLISHING CO. LIMITED

in the interests of the Builder, Contractor, Architect and Building Trades

MANAGING EDITOR - K. A. MACKENZIE, B. A. Sc.
ASSOCIATE EDITOR - - - A. E. UREN

Present Terms of Subscription, payable in advance:

CANADA and GREAT BRITAIN - - - $1.50
UNITED STATES and other countries - - - $2.00

Advertisement Rates on Application.

HEAD OFFICE - - 59-61 JOHN STREET, TORONTO
Telephones Main 7427 and 7428.
EDITORIAL OFFICE - - 43 VICTORIA STREET, TORONTO
Telephone Adelaide 107.
MONTREAL OFFICE - - - ROOM 13 CORISTINE BLDG.
Telephone M. 7106.
CHICAGO, ILL. - - - 4075 PERRY STREET

Address all business communications to the Company. Everything affecting Editorial Department to the Editor.

Notice to Advertisers

Changes of advertisements should reach Head Office two weeks before date of publication.

VOL. I. TORONTO, CANADA, MARCH 15, 1911 No. 2

CONTENTS OF THIS ISSUE

Editorial—

The Vacant Lot and Single Tax 47
Comparisons on Canadian and American Building Statistics 47
Fire-Resisting Wood 49
Co-Operative Apartment Blocks 50

Leading Articles—

Attractive Suburban Cottage Finished in Cement Stucco 51
Conscious City and Town Planning 59
Fire-places for the Modern House 62
Economizing Time in Building Work 65
Interior Finish of Metal 67
Proper Gas Piping Specifications in Building 71
Remarks on Panelling 72
A Page of Paint Facts 74
Hot Air in House Heating 75
Waterproofing of Structures 76
Identification of Wood 79
Calgary's Wonderful Building Progress 80
What New Workmen's Law Will Ontario Obtain 82
Editorial Notes 84
Law Relating to the Builder and Contractor 88
The Labor Market 90
Book Notes 91
Manufacturers' Notes 92
Markets 93

Editorial Notes

The annual meeting of the executive of the Union of Canadian Muncipalities was held in Ottawa on March 8th, the president, Mayor J. A. Chisholm, K.C., of Halifax, in the chair.

* * *

The English company which is forming garden cities throughout the British Isles extended an invitation to a delegation of the Union of Municipalities to visit some of their cities. The matter was left in the hands of the president and secretary, who will complete arrangements for the sending of a delegation. The president of the Garden Cities Company is Mr. Henry Vivian, ex-M.P.

* * *

The subject of town planning was discussed at length by the executive, and it was decided to make it a feature of the program of the next convention.

* * *

The program for the annual convention of the Union at Quebec, August 29-31, was discussed at length.

* * *

A discussion also took place on bills before the House of Commons affecting the rights of municipalities, and the executive decided to do all in its power to protect the rights of municipalities.

* * *

Those present at the meeting included Mayor Chisholm (Halifax), Mayor Hopewell, Mr. Fred Cook and Controller Champagne (Ottawa), Mr. W. D. Lightall and Mr. Wilson (Montreal), and Reeve McNaughton (North Vancouver).

* * *

Prices of cement both in Canada and the United States have a been a frequent topic of discussion recently. The situation in the United States is particularly interesting. Reports there have been conflicting regarding the real prices of Portland cement, some companies, notably the Atlas, quoting somewhat higher than others in the Lehigh Valley district. It is stated, however, on the best authority, that the present average price of the commodity in bulk at the mill is 75 cents a barrel. It is possible that the Atlas people may be getting as high as 80 cents, but this probably does not prevail in all instances. It is certain that under the present method of handling the bags in which the cement is shipped, and the high price of cotton, that there is a loss in the bag account alone, which will reduce the net profit even below the 75 cent quotation.

* * *

Consumption of Portland cement throughout the United States during 1910 reached the enormous total of 73,000,000 barrels. Working at their full capacity, it is estimated that the country's plants could easily produce 100,000,000 barrels annually. In other words, the mills in 1910 worked at about 75 per cent. of capacity.

* * *

In expressing views on the present situation leading interests of the industry are fairly optimistic concerning the outlook for the current year. W. P. Corbett, secretary of the Alsen's American Portland Cement Works, said along this line: "We are conservatively optimistic and are of the opinion that a great deal of the present pessimism is uncalled for. It looks to us as if general business will be reasonably good for the current year and would work steadily toward an improvement, barring some calamity, which is not now in sight. We do not say this because of our fortunate position in having so many large works under full swing in localities which we can reach to advantage, which has permitted us to sell so much cement ahead at considerably higher than prevailing figures, but because this is an expression of our carefully considered views. Even if there should be a further break in the eastern market, which we hardly look for, we are confident that it will be only temporary."

Commenting along a similar strain, John R. Morron, president of the Atlas Portland Cement Company, made the following remarks: "Shipments of cement are always light at this time of the year, and concerns with foresight very seldom care to contract for large quantities to be distributed during the year at the prices which usually prevail during the winter months. We anticipate that the current year will be a good one for cement producers. Following a panic, and during convalescence, investors very often return to building rather than to re-investment in securities which caused them more or less worry during a period of unrest. We think a price more nearly horizontal on cement would be more satisfactory to all concerned than a price fluctuating according to various extreme conditions."

* * *

Raw materials for building purposes are plentiful in Ontario, including clay for making brick, etc., limestone for lime and construction work, sandstone and granite, Portland cement, etc. Building operations were brisk in 1910, and called for an increased production of brick and lime as compared with 1909. The Portland cement industry is steadily growing, the production being 2,889,235 barrels, as compared with 2,633,500 barrels in 1909. The aggregate value of products which may be classed as construction materials, including brick and other clay products, stone, Portland cement and lime, was $7,961,060. Part of the stone, however, was for use as flux in blast furnaces and road making.

* * *

At a recent inquest held at Chatham, Ont., the jury stated there ought to be more safety appliances in connection with gas fixtures.

* * *

The bills providing for the filing of plans of suburbs in close proximity to cities were again considered by the Municipal Committee of the Ontario Legislature, when Mr. Geo. Neely (Middlesex) opposed the proposition. The bill was laid over till the next session. He said the proposal would be a hardship, and would prevent men from selling even a small portion of their property if it was within a certain distance from a city. If the bills were going to be adopted, he suggested that they be limited to the City of Toronto, which was anxious to have the regulations passed.

Mr. R. H. McElroy (Carleton), the father of one of the bills, said it would be better to allow the proposals to stand for another session. The only cities asking for the regulations being Toronto, Hamilton and Ottawa, and in Hamilton and Ottawa the restrictions would affect property which would not be taken into the cities for fifty years. Toronto was in a different position. He thought the members should have an opportunity of getting opinions from their constituents before taking final action.

Mr. Neely said it was difficult to tell how a city would develop, and if such stringent restrictions were placed on the laying out of suburbs it would be a hardship on the owners of property.

Mr. McPherson said his bill was an intelligent effort to deal with conditions. Mr. Jas. McEwing (Wellington) said a new hamlet might spring up four or five miles out of Toronto. He couldn't see why Toronto should have anything to say in the matter of how the streets there should be laid out.

* * *

That the volume of building operations in Montreal is beating the record of the preceding month by more than 100 per cent. is evidenced by the report for February, which was given out by Building Inspector Chausse this morning. During the month of February permits for new buildings amounted to $572,740, an amount represented by eighty-six permits. Fifty-four alteration permits totalled $69,388, a total altogether for the month in new buildings and alterations of $642,428, and 140 permits. The figures for February, 1910, were, for new buildings, $233,800, representing 72 permits, and alterations $32,230 for permits. The total figures for February, 1910, being $274,030, and 107 permits. The increase for last month over the figures for February, 1910, amounted to $368,398, with 133 more permits.

* * *

Ottawa has had considerable typhoid trouble, and impure water is said to be the chief cause. Mr. W. Johnson, of that city, thinks that houses which are not connected with drains may have much to do with the outbreak. Writing to a local paper, he says: "I have always noticed that when an epidemic of this kind occurs, the purity of the water is first questioned; and no doubt this may be all right as far as it goes, but I am one of those who believe that the water is the cause of all this sickness. We have seen the Ottawa river much lower than it has been this winter, and I cannot believe that the large volume of water flowing in the river at the present time can be so impure as it is said to be, to cause such an outbreak of typhoid. It would be interesting to know if there are any cases of fever in houses that are supplied with city water, but not connected with the drainage system. Now, sir, what I wish to speak about is the sewers. Are they above suspicion, that we hear so little of them? These sewers that have been hermetically sealed up during all the winter months, in my opinion, are very far from that. When all the inlets and manholes are frozen up throughout the city the gases that are being generated in the sewers cause a certain amount of pressure which forces them into the basements of dwellings, poisoning the air we breathe and causing sickness of different kinds. To remedy this great and growing evil I would suggest that ventilating shafts be constructed in different parts of the city, and connected with the main sewers. These ventilating shafts would have to be heated with a centre flue, and should be at least sixty feet above street level. Have the manholes in certain parts of the city open in winter and summer to allow the fresh air to be drawn in and circulate throughout the entire system, carrying all gases and impure air along with it and through the ventilators. If this work was properly constructed and put in operation, I venture to say it would remove all danger of sewer gas entering any house. It would destroy all germs of disease, and do a vast amount of good to suffering humanity.

Prominent men in the trade are of the opinion that present conditions cannot endure, and believe that a break upward may be expected before long. It has been even hinted at in some quarters that the low prices now prevailing are the result of a concerted effort on the part of some of the large producers to force their smaller competitors out of the market entirely or to coerce them into making overtures for absorption.

* * *

The products in 1910 of the cement industry in the Province of Quebec show an increase in value of $640,095, which is a proportionate increase of 48 per cent. over the value of the production of the preceding year. Such increases are significant, and indicate the preponderating part which cement is taking among the building materials. It is sufficient to recall that in 1904 the total production of cement in the Province was slightly over $50,000, while two years later it was $625,000. It is now nearly $2,000,000.

All of the other building materials show very large increases in Quebec Province as compared with the previous years. Part of these increases is undoubtedly due to a more thorough collecting of figures, but, nevertheless, there has been a much greater building activity throughout the Province than ever before.

It will be noticed that the item sewer pipes, tiles and pottery on the other hand has decreased from $270,000 in 1908 and $125,000 in 1909 to $103,000 in 1910. This is not to be taken as an indication of a decrease in the manufacture of these clay products, but is owing to the fact that the production of several important manufacturers of sewer pipes, tiles and pottery which was included in previous years was eliminated this year on discovering that they use clay imported from New Jersey. The value of such products would have amounted this year to over $350,000.

* * *

An illuminating return on the lumber production of Canada has been issued by the Dominion Forestry Department. The figures are for 1909, the latest year for which complete returns are available. The total increase in production was 13.9 per cent. and among other interesting facts brought to light are, that Ontario alone produces two-fifths of the Canadian lumber, that spruce is the leading Canadian species; that only 6 per cent. of the wood produced in Canada is hardwood, and that the production of square timber for export has declined to such an extent that only one-twelfth as much is produced as formerly.

The total production was 3,814,942 feet, board measure, and its total value $62,819,477.

Large as this may appear, it is a little less than one-ninth of the lumber cut in the United States for 1908, and a little less than that cut in Washington state in 1907.

The average value of lumber in Ontario was $19.80 per thousand, whereas in Nova Scotia it was only $11.95, a higher price is charged in Ontario for nearly every species of lumber than is secured in the other provinces.

* * *

Mr. H. D. Gamble, K. C., representing the Dominion Steam Heating Co., recently asked the Board of Control to seek an amendment to the Public Franchise Act so as to allow the residents of any district to vote for the establishment of a steam heating plant. At present such a franchise can be approved only by a vote of the ratepayers over the entire city. Rosedale, Mr. Gamble said, is ready to consider such a franchise.

"We would not deal with this until it has been dealt with by the Legislative and Reception Committee," said the Mayor.

Controller Spence—"And we should not deal with it at all until we have definitely decided that this is a form of public utility that the city itself will not operate."

PORTABLE HOUSES FOR ARGENTINA.

The expense of building brick or masonry houses in Argentina, owing to the lack of timber and other building materials, and the fact that often in the rural districts only temporary occupation is contemplated, combine to create an important market in that country for portable houses; into which special inquiry is now being made by an agent of the American government. In the course of an interesting and valuable report, this agent says: Something better than the present huts now seen in many places, and yet less expensive than permanent brick and masonry construction, would undoubtedly be received with favour. The Buenos Aires representatives of a foreign firm making bungalows have recently begun an effort to introduce that type of dwelling into the country, and it is probable that United States manufacturers of similar goods would find it to their advantage to investigate the field. A light, portable bungalow of wood or other material would appear to meet Argentine needs, and the amount to be realized in such construction would doubtless cover the cost of transportation by water to Buenos Aires and thence inland by rail and other means. It might be necessary to send representatives to the country to carry on the work, as existing agencies would be apt to prove deficient both in zeal and knowledge, of overcoming the preliminary difficulties bound to be encountered in pushing anything involving so much of an innovation. A thorough knowledge of the Spanish language would, of course, be indispensable, both for dealing with customers and the workmen whom it would be necessary to employ in construction and transportation. It would also be essential to bear in mind that a distinctly different type of house would be required in Argentina from that to which bungalows contruction is mainly devoted in the United States. Here the demand for bungalows is chiefly from fairly well-to-do persons for summer homes. In Argentina, in order to be successful, bungalows would have to be sold mainly as houses for the working classes, and the frequent fluctuations in the price of materials, but, in case of doubt as to the correctness, either of the gross value declared or of the discounts, the importer must produce, as well as the original invoice, the seller's catalogue and statement of trade terms. It is, of course, understood that these documents shall not prevent the administration from demanding *expertise* if deemed necessary. The circular points out that it is usual in certain countries to quote export prices much lower than those for the inland trade. It may, therefore, happen that the value declared on invoice, although in accordance with catalogue prices and discounts, may be below the intrinsic value of the goods. In that case, experts will be called on to declare the real value, i.e., price in quantity at the place of manufacture, plus accessory expenses. Importers can, if they prefer, produce invoices, only mentioning net price, if same be duly *visees* by the competent authority. Such invoices will be examined with equal care by the customs service, and checked by catalogues of foreign manufacturers and lists of discounts.

School Rooms Are Not Hygienic

Report of Dr. J. E. Laberge to the Board of Control of Montreal.

Dr. Laberge recently brought in a report to the Montreal Board of Control based on his experience and observations. While the report is especially directed toward schools the conditions apply with almost equal force to all buildings. The school, according to Dr. Laberge, should be the most powerful promoter of vitality and health amongst children, whilst in reality, under present circumstances, it has been found to be the antithesis of this. At the end of a school year the children should be better developed in every way, should be able to offer greater resistence to disease, and their blood should be richer in hemoglobin. As a matter of fact, the experience, as far as local schools are concerned, has been that children at the end of the term have been found to be weaker, more anaemic and less able to resist disease, than when they entered the school at the opening of the term. All of which ,according to the chief of the inspection department, is a result of an improper application, on the part of school authorities, of the principles of hygiene.

Continuing, Dr. Laberge gives the result of his observations at the recent Convention of School Hygienists, which took place at New York last week, and which Dr. Laberge attended. The great requisite in all schools was a continual supply of fresh air. From investigations made and reported by hygiene specialists at the convention, it had been established that children kept in class rooms, where there was not a proper method of ventilation, had been noticed to suffer considerable decrease in the amount of hemoglobin in the blood. This loss had been fixed at an average of 10 per cent., whilst in the case of children in class rooms which had been continually well aired, it had been found that there had been an average increase of 74 per cent. in hemoglobin. Nor was it only in the blood that the improvement had been noticed. Thus, from actual investigations made, it had been found that one direct effect, of the fresh air system had been a noticeable increase in the weight of the children. Cases cited had shown that within the space of ten weeks this increase had been from 68 to 86 lbs.; from 40 to 45 lbs. in four weeks, and from 74 to 94 in five months. Actual tests had also shown that an increase in height had followed the fresh air treatment in schools, and instances had been met with where this increase had been from one-eighth to one-half inch in the space of two months.

A matter with which the delegates at the convention dealt was the practice of sweeping the class rooms. It had been unanimously determined upon by all the delegates that, in the interests of all concerned, it was advisable that sweeping should be done by the aid of the vacuum cleaner system. In this way all dust was disposed of without having the atmosphere of the class rooms laden with it. Failing the adoption of such a system, it was recommended that all floors in schools should be oiled, as in this way the dust was rendered to heavy as not to be carried through the air to be breathed by the children.

Another factor in the bettering of school room conditions was the practice of keeping the air continually humidified. Dry air, according to the experts present at the congress, was highly detrimental to the health of all children, as it sapped their vitality.

The temperature of the class room had also a great effect upon the health of the pupils. Thus, air heated at 70 to 80 degrees Fahrenheit, resulted in fatiguing the children; the proper temperature for class rooms was from 60 to 65 degrees. It was advisable that all windows in the class rooms should be kept open, when the weather was not too inclement for such a practice.

As to the duration of the hours of class, the convention registered itself in favor of having no class continued for a longer period than one hour. At the end of every hour the children should be marched out of the class room, and made to take part in gymnastic exercises, play etc., In the meantime, the class rooms should be thoroughly aired by throwing open doors, windows, etc.

"Placard" The Bad Plumbing

Dr. R. P. Robinson of the Ottawa Board of Health, is of the opinion that their plumbing by-law is decidedly defective and at the next meeting of the board will take the initial steps to have it amended.

Speaking to The Citizen, Dr. Robinson said that in some cases the by-law was too severe on poor property owners, but in most cases it was altogether too lax. He said that there should be a provision in the bylaw giving the inspector power to enter any house in the city, and where he found the plumbing defective to order it to be remedied, If his order was not executed the city should have the necessary work done and charge the cost up to the property.

Plumbing Inspector Jacques, who will be asked to appear before the board of health at its next meeting and give his opinion on the working of the present by-law, was also seen by The Citizen. He said that the plumbing by-law to some property owners was like a red rag to a bull. He thought that it was satisfactory on the whole, but admitted that there were a few provisions which might be added to advantage.

"I have been working here ever since this by-law was framed," said Mr. Jacques, "and I have never found anything particularly wrong with it. If everybody would live up to its requirements there would be no difficulty."

Mr. Jacques admitted that there were many houses that were not fit for habitation from a sanitary standpoint, but he doubted if they were worth spending the amount of money necessary to make them so. He said that the sanitary inspector had power to enter all buildings, but the plumbing inspector had not. It would be a decided advantage to have this power. Then a building whose plumbing was inadequate or defective could be declared unfit for habitation and placarded the same as quarantined houses were. He thought this would be a means of bringing different landlords to time.

The origin of the word varnish is interesting and of a romantic nature. Berenice, wife of one of the Ptolemys of Egypt, a grand-daughter of a half-brother of Alexander the Great and an ancestor of Cleopatra, was blessed with a crowning glory of red-gold hair. The Greek sailors, in their voyages to distant African ports, occasionally found the rare and valuable resin now known as amber, and called it Berenice in honor of the beautiful Egyptian queen's tresses. Berenice is equivalent to the Greek Pheronice. *Ph* sometimes had the sound of *v* and the name was pronounced Veronice. The Romans, referring to the amber, made it vernice and their descendants further exchanged vernis. The Anglo-Saxon form became varnish.

Law Relating to the Builder and Contractor

Edited by Robert Wherry, B.A., LL.B., of Osgoode Hall, Barrister-at-Law.*

[*Editor's Note*—It is the intention to insert in these pages, with an occasional explanatory note, the most recent legal decisions affecting the builder and contractor, whether with reference to mechanics' liens, building contracts, workmen's compensation for injuries, or otherwise. Every province in Canada will be covered in due course.]

One of the most important branches of law from the standpoint of the builder and contractor is that relating to mechanics' liens. The reader will know from his personal experience that recourse to a mechanics' lien to enforce a claim for material and work is of common occurrence. Sometimes the dispute is as to the construction of the contract; sometimes as to the efficiency of the material supplied or work done under it, or both; and very frequently as to the amount chargeable for extras. And just here it may not be out of place to arm the prospective contractor and builder with a little bit of advice as regards extras. Always have the extent and cost of extras put down in black and white. If this injunction is followed our courts will be encumbered with less work, the lawyer's fee will be eliminated, and the parties to the contract will be money in pocket.

Mechanics' liens are of comparatively recent origin. From time immemorial, without the intervention of the legislature, yet sanctioned by judicial authority, and right down to the present day, the man who performed labour on or supplied parts to a chattel, had the right to hold it in his possession until such time as he was paid in full for such service or material. For instance, if a man orders his suit to be pressed and that work is actually done, the presser can retain the goods until his claim for services performed since they last came into his continuous possession, has been paid. In other words, he has a lien. But this law was applicable to chattel or personal property only; it never applied to land.

Land, in law, comprises everything downwards from the surface to the centre of the earth, and upwards to the sky, and this, whether or not there is a building on the surface. Anything affixed to the soil in such a way that separation would produce a change in its character is part of the land, and in a conveyance will pass with the land, although not specifically mentioned. Read the conveyance carefully the next time you buy a house and you will notice that no mention of the house is made therein. To illustrate: a structure is erected on a foundation extending downwards into the earth. This is an immovable, and is a part and parcel of the land, and will pass to the purchaser of the land without any mention of it being made. Suppose, on the other hand, you build a dog-house, which can be moved from place to place, on the surface, without changing the character of the soil; this is a chattel and in no wise a part of the land, and will not pass with the land. The reader will keep in mind this meaning of land.

We have said that formerly a lien attached only to chattels. The reason given for its not attaching to land was that it would be most inconvenient; for the ground on which a house or other structure stands is inseparable from that house or other structure, and such a lien would exclude the owner from his own land. The material man or workman had to rely only on the personal liability of his employer. He had no lien by reason of his having supplied materials or performed labour on the land. It required a legislative enactment to produce anything even approaching that effect. This was somewhere in the seventies in Canada. Ontario was the first province to have a "Mechanics' Lien Act." Since then all the other provinces have passed similar acts; all of which have been subjected to numerous amendments, and in their present form can scarcely be recognized from their ancestors.

This brief outline may suffice to give one who is not trained in law a general idea of the theory of mechanics' liens. But, remember, there are many formalities to be complied with in order to found a valid lien. These differ more or less in the various provinces, and it is advisable to make a careful perusal and minute study of each act.

ONTARIO.

Are municipal lands actually required for municipal purposes exempt from the operation of the Mechanics' Lien Act?

A county judge held that lands of a municipality actually required for the use of the municipality, such as for fire halls, police stations, etc,. are exempt from the operation of the Mechanics' and Wage-earners' Lien Act on the grounds of public policy and public convenience. The Divisional Court allowed an appeal from this judgment and remitted the action to the County Court judge for trial. The Court of Appeal affirmed the order of the Divisional Court on the ground that the language of some of the sections of the act seemed to imply an intention to bring at least some classes of municipal properties within its provisions. General Constructing vs. Ottawa—16 O.W.R. 479, 1 O.W.N. 911.

The plaintiffs brought action to have it declared that they had a lien for $325.92 upon the estate or interests of the defendants, owners of certain lands, and for judgment against the contractors to whom they had supplied materials used in the construction of a building for defendants. The last delivery was within 30 days of the filing of the lien. It was 84 cents worth of expansion bolts. The action against the owners was dismissed by the official referee, who ordered that the lien registered against the lands should be vacated, but he gave judgment against the contractors for $325.92. Divisional Court allowed plaintiffs' appeal against the owners of the land as the bolts were supplied to be used and were actually used in the construction of the building, and a lien therefore attached under section 4 of the Ontario Act, Edmonds vs. Tierman (1892) 21 S.C.R. 406, has no application in Ontario owing to the provisions of S. 28 of the Ont. Act, and a plaintiff's lien is not destroyed or prejudiced by taking a note and discounting it, and if the note is returned unpaid the plaintiff is entitled to rely on the original accounts and file a lien for the amount of the note as well as for goods supplied after taking of the note. Court of Appeal reversed judgment of Divisional Court and restored judgment of the official referee with costs. Brooks-Sanford vs. Telier (1910) 17 O.W.R. 167, 2 O.W.N. 138.

A liquidator represents no higher claim than that of the insolvent company; therefore liens registered, within 30 days after their commencement, for materials supplied and for work done, prior to the service of the petition to wind up the company, are to be paid in priority to ordinary creditors. Re Clinton Thresher Co. (1910) 15 O.W.R. 318.

---

* Wherry & Balfour, Continental Life Building, Toronto.

Plaintiffs sought to enforce a lien claimed for work done and materials supplied in building an hotel. Defendants, according to agreement, were to make payments each month, upon production of architect's certificates that such payments were due. Nine progress estimates were given plaintiffs by the acting architect, the last of which was dated 1st June, 1908. In February or March defendants refused to make further payments on ground that plaintiff had failed to furnish a satisfactory bond "for and conditional upon" the performance of their agreement. Pending the action ten days before trial the architect gave plaintiffs another progress certificate, showing a balance due plaintiffs of $6,730.13. The local master at Kenora held that defendants were not justified in refusing to make further payments, nor were plaintiffs justified in discontinuing their work. He gave plaintiffs judgment for amount certified due on 1st June, after deducting payments on account and $991 for insurance on hotel after 1st January. The Divisional Court varied the judgment of the master by increasing plaintiffs' judgment by $991, the amount of the insurance, and added to the judgment an order that any surplus which may be realized by sale of the hotel after payment of sums directed to be paid out of the proceeds, shall be paid into court subject to further order, and reserving leave to plaintiffs to apply in respect of the lien, which they have and for which payment has not been provided for by the judgment. Kelly vs. Tourist (1910) 15 O.W.R. 29, 20 O.L.R. 267.

ALBERTA.

Section 11 of the Mechanics' Lien Act applies only where work is done or materials provided to improve property at the instance of some person having no interest whatever in the property improved. It is only against the interest of such a person who, having knowledge of the fact, fails to relieve himself of the responsibility in the manner indicated by section 11 of the Mechanics' Lien Act that lien will attach. While in section 4 of the Mechanics' Lien Act, the "interest" affected by a mechanic's lien is the interest of the "owner" as defined therein, still where the interest primarily affected is a leasehold interest which is subject to be divested on breach of covenants, the lessor cannot exercise his right of re-entry to the prejudice of the lienholder, without reasonable notice to him. In such a case where property has been increased in value by the work done for which a lien attaches to the lessor's interest, the lien takes priority to the extent of the increase in value in the same way as in the case of a mortgage. A superintendent of the work of construction is entitled to a lien for such superintendance. If irregularities in the form of lien do not prejudice any one and the form is a substantial compliance with the prescribed form in the schedule of the Mechanics' Lien Act, the irregularities are not fatal. Scratch vs. Anderson, 2 Alta. L. R. 109.

The lands of a school board may be made subject to a mechanic's lien. The installation of a furnace in a building comes within the terms of section 4 of the Alberta Mechanics' Lien Act. If the act is to be strictly construed against the person claiming the lien, it is so only in the construction of the sections dealing with the creation of the lien, and not of those dealing with its enforcement; and, even as to the former, section 14 of the act requires only a substantial compliance. A sub-contractor is bound to show a substantial performance of his own contract with the contractor, but is not bound to a strict compliance with the terms of the principal contract. Section 24 of the act gives the court power, in a lien action, to deal fully with the rights of all the parties who are before it. Upon the evidence, the plaintiff, a sub-contractor, was held, to have strictly complied with his contract with the principal contractor, and to be entitled to enforce his lien, notwithstanding that the furnace which he installed was rejected by the owners, a school board. Held, also, that there was no unreasonable delay on the plaintiff's part in completing this work. Mallett vs. Kovar (1910) 14 W.L.R. 327.

BRITISH COLUMBIA.

Where a plaintiff claims to revive a mechanic's lien by means of material supplied and work done after the completion of a building, and after the architect has given the final certificate, it is incumbent on him to prove clearly that the material was supplied and the work done in pursuance of, and as a part of his original agreement. The defendant built a house, which she supposed was completed on the 15th of September, 1909, when her architect accepted it, and 40 days later issued his final certificate. The final payment was made on the 8th November. On the 26th January, 1910, the plaintiff, a plumber, changed a register, the original one not being according to specifications. A month before that the contractor had left Victoria, and the plaintiff knew it. The architect and the defendant were not aware that anything further was to be done, and the defendant did not know, until served with the summons in this plaint to enforce the lien, that the register had been changed: Held, that the change in the register was not to be regarded as part of the work to be done under the plaintiff's sub-contract so as to keep the lien alive. It was sought to make the defendant personally liable because her husband had requested the plaintiff to do the work: Held, that the facts shown were not sufficient to justify a finding that the husband was the wife's agent. Lawrence vs. Landsberg 1910), 14 W.L.R. 477.

Plaintiff, a sub-contractor for plastering, had allowed the time for filing his lien to expire. Under the building contract the plasterer was to "fix up" after the other trades. He now attempted, against the instructions of the defendant, the owner, to do some "fixing up," worked about four hours and then filed his lien: Held, that as he was trying to manufacture a lien his action to enforce his lien must be dismissed. Sherritt vs. McCallum (1910), 12 W.L.R. 637.

QUEBEC.

The supplier of building material only acquires a privilege for the amount of his claim provided, before delivery, he gives a notice to the proprietor of the immovable in which are contained the costs of the materials and the building for which they are intended. A promise of sale of the property by the proprietor to the contractor to whom the materials have been supplied and delivered, and which has not been registered, is without effect as to third parties insofar as the creation of the privilege is concerned. Rutherford & Sons Co. vs. Racicot (1909), 19 K.B. (Que.) 428.

The Labor Market

Among the workmen of the building trades five were killed during December, 1910, and seventeen injured, as against twelve killed and twenty-four injured in November last, and two killed and fifteen injured in December, 1909. Two of the deaths were due to falls, and one respectively to falling material, to exposure and to an explosion. Of the injuries, eleven were due to falls, four to explosions and two to falling material.

At a meeting of the district council of the United Brotherhood of Carpenters and Joiners, of Winnipeg, the question of better remuneration was discussed at length, and the meeting was unanimously of the opinion that the members of this craft were underpaid. The following resolution was adopted:

"That this district council is taking means to notify all employers that it is making demands for the season of 1911. A notice has been sent to the Builders' Exchange to this effect."

The membership of this union is at present 678, but in the summer-time it will be increased to 1,500 or 1,600. Four business agents have been appointed to thoroughly organize all the carpenters not at present union men. The Icelandic branch of this union has a membership of about 150.

The builders' exchange of Edmonton has declared for the open shop for all trades unions, annulling the agreement which they held with the carpenters' union. This will probably result in a fight all along the line, and tie up one of Edmonton's best building years. Five million dollars worth of building will be tied up if the trades union decide to fight.

"Unite the trades in the building industry," is the slogan of the union leaders in the city. At a meeting of the Building Trades Council in the Labor Temple, in Toronto, this was the chief subject of discussion.

The leaders of the international locals have been advised by their international presidents to use every effort to prevent a conflict in the spring regarding wages.

This spring nearly all the unions will be seeking new agreements, and the leaders realize that it would be much easier to obtain an increase from their employers if all the trades made their demands for an advance at the one time, and by the one joint committee.

With this end in view conferences will be held weekly by representatives of the different trades to bring about that which all desire, improved conditions, without a fight.

The leaders have stated that they would make every effort to start the spring trade without a struggle.

"We do not want half the summer to be over before we can arrange a settlement with the bosses.

'We are hopeful that the bosses will look at the matter in the same way, and when the spring trade opens all will be ready to start a good season's work.

The trades in the building line are:—Bricklayers, plasterers, carpenters, laborers, plumbers, steamfitters, lathers, electrical workers, sheet metal workers, painters, stone cutters and granite workers.

In the past many efforts have been made to unite in a demand for wages, but failure followed.

THE LABOR UNION AS THE EMPLOYER'S ALLY.

The brassworkers' union in Great Britain is proposing one of the greatest advances ever made in trades unionism. It is not an effort to push wages up to an unreasonable point; it is not an effort to obtain shorter hours, at the same or greater pay; it is not an effort to exclude from work every man who does not belong to their particular society. It is an earnest effort to bring the men and their employer closer together, and so far as possible, to make their interests identical. It seeks to remove the great bone of contention between employer and men, of grading all men alike and paying them the wages of that grade irrespective of their skill or ability.

Our information is derived from a report of the American Consul Albert Halstead. A conciliation board, selected from the employers and workers in equal number, to settle a dispute as to wages has proposed the following arrangement, and it only needs the sanction of the men to become effective. The union is to divide its members into five grades, dependent on their skill and experience, the men to be compensated in accordance with their grade. The union cards of the men will indicate the grade to which they belong. The employer is to have the right to challenge the qualification of a man for the grade to which he has been assigned, in which case the union will require the workman to submit to an examination by the municipal brass school. Should the workman pass, the employer will pay a nominal fee to the school, and should he fail, the union will reduce the grade of the man. A workman has the right to qualify for a higher grade by submitting to an examination.

There can be no question that the adoption of the above program will be the most progressive step ever taken in trades unionism. Consistently lived up to, it will remove most if not all of the suspicion with which the employer has regarded union labor. The labor union has long been considered a powerful weapon for the coercion of the employer to the workman's advantage, a device for obtaining the maximum of pay with the minimum of service. The union now proposes to ally itself with the employer, and to determine for him which men are best fitted for certain kinds of work. Instead of insisting that the poor workman shall benefit equally with the good one, it recognizes that the man of greater ability and industry is entitled to the greatest reward.

We have long held the opinion that it was possible for the unions so to conduct themselves, that the employer would welcome them in his shop. We felt that if the union card was made a certificate of merit and ability, guaranteeing that its holder was a man of notably greater skill than one who did not hold one, that the closed shop, so ardently desired by the union, would automatically be established. Admission to the union should depend on the ability of the worker in his trade, and not on his pull with the business agent or governing faction. "Grading" the members, as proposed by the brass workers, would insure that the employer would not have to pay a high price for a low grade worker.

The benefits of such an arrangement would be reciprocal. The employer would know that the holder of a union card was a man of ability. He would not have to experiment on his men, but could set them at a job with the confidence it would be performed rapidly and correctly. He would naturally turn to the union when he required more men, for he would know that there he would find the men of the kind he needed. The union would build up its membership, for workmen would soon learn that it would be easier to get a job if they held a union card than if they did not. The fact that the employer would hire the union men in preference to non-union would practically bring about the closed shop without any agreement being necessary. The grading of the men would tend to do away with disputes as to wages and hours, for, as a rule, the employer does not object to paying the good man what he is worth. He does object to paying the poor worker the same wage as the good one. Inasmuch as the union itself would classify the men, they could not object to some men being paid less than others.

We would be pleased to have the ideas of Canadian employers and labor leaders on this plan.

Book Notes

CEMENT AND HOW TO USE IT. Edited under the supervision of William A. Radford. Pages 361; size 6 x 9; price $1.00.

The work is a simple and comprehensive treatment of what is known as "Cement," including both the Portland and the natural cements. The volume presents rather the practical side than the technical side of the uses of cement and concrete. It is written as nearly as possible in non-technical English, and would serve as a practical guide, not only to the experienced worker in concrete, but also to the novice. The use of mathematical and engineering formulæ has been avoided in this work. Useful information and practical working tables which are deduced from the results of much labor and experience of engineers are freely used.

An elaborate introduction opens the book, which treats of the history and development of cement.

The importance of every builder and contractor, and everyone of kindred professions possessing to some real degree a reliable knowledge of the character and uses of the various cements, can be readily seen, for as the author says, "Cement is stronger and more durable than natural stone, unaffected by fire or moisture, capable of adaptation to any position or condition, workable by unskilled labor, lending itself easily to any form of ornamentation, vermin proof, cleanly and comparatively inexpensive, ranks among the foremost of the valuable gifts to mankind from the treasure house of modern scientific and technical research."

The introduction is a treatise on this important material and as emphasis to his statement he gives the history of cement which is apparently rich in strong examples of its stability and surprisingly old as a building material. The surprising development of the cement industry is also an interesting feature dealt with in the opening pages of the book. The manufacture of Portland cement and the chemical requirements of a good Portland cement are discussed. A section upon the proper selection of aggregates for concrete is very interesting from a practical standpoint. The matter of testing is gone into at some length and illustrations of descriptive nature appended, showing simple testing machines, and method of applying tests. A description of the various mixtures of concrete is given and useful tables for facilitating the solution of practical problems, which present themselves in the mixing. Much valuable information can be gathered regarding the matter of depositing concrete, protection after placing and the bonding of old and new concrete work. A section on waterproofing of concrete merits notice. In this a general discussion of the subject of waterproofing is given and the various methods at present in use are briefly described. The machinery and tools used in concrete work are also dealt with. A considerable portion of the book is given up to a discussion of cement in building construction, concrete foundation work, concrete sub-floors, cement plaster and stucco work, concrete blocks, and up-to-date systems of house construction, being some of the topics considered. Concrete sidewalks construction, together with the various methods in use, are discussed and the problems met within every modern community are therein dealt with briefly. The farmer is now appreciating the use to which concrete may be put in supplying the constructional needs so vital to the proper development of any farm from a utilitarian, as well as from an aesthetic standpoint. To this growing class among the users of concrete a section concerning concrete on the farm will appeal. In it helpful advice is given as to where concrete can be used to advantage in farm building work.

A treatment on reinforced concrete is contained in the last 85 pages of the book. In this section the author discusses the time of setting, the cost and the general principles of reinforced concrete design. The various systems of reinforcement are described very fully and the structures for which the use of reinforced concrete is advisable in construction, are given some space. This portion of the book is especially well filled with descriptive sketches and plans of reinforcement forms, steels and systems.

The book contains several attractive and instructive plates and has plenty of descriptive material about concrete novelties, which it would be impossible to mention here. While many of the subjects taken up are briefly treated with, nevertheless fundamental and valuable information on that subject is given. It should be of value to all who desire further knowledge of cement and its uses and who do not care to study at too great a length in order to obtain the few fundamental facts they seek for.

Manufacturers' Notes

Seaman-Kent's New Factory

The real merits of any commercial product can possibly best be measured by the growth of the concern which manufactures it. Quality and demand invariably go hand in hand, and where the one is recognized a constant increase in the other follows as a natural sequence. Although only a firm of eight years' existence, the Seaman-Kent Co. has, by progressive business methods and production of a uniform high-grade hardwood flooring, won for itself a place in the foremost industrial ranks of Canada. During that time, the company has not only been under the necessity of enlarging its factory at Meaford, Ont., but within the past few months it has found it advisable to establish a large branch plant at Fort William in order to meet the demand and better serve the interests of its rapidly expanding Western trade. The new plant occupies three acres of a twenty-acre tract, and is excellently situated, having 600 feet of dockage on the Mission River and direct transportation facilities to assure the prompt delivery of all orders. It comprises in all four buildings, viz., a 400 x 100 feet factory built of reinforced concrete and heavy timber construction, a power plant 65 x 100 feet, and dry kilns, 123 x 80 feet, and a two-storey office building. The remaining portion of the site is utilized as storage yards for lumber. At the present time, the working staff of the new plants consist of eighty employees, but it is expected that the business will warrant the working of two hundred hands by the early part of next summer.

In addition to manufacturing "Beaver Brand" hardwood flooring, which has gained for the company a universal reputation throughout the Dominion, the new plant will manufacture quarter cut and plain cut oak flooring, together with birch and beech products and hardwood interior trim. During the winter, five million feet of lumber will be turned through the machines, but a much larger proportionate amount of material will be required when the plant is working to its full capacity.

The company in so thoroughly preparing to look after the needs of such an important and promising field as the West, take a most aggressive step, and the business sagacity and enterprise which it displays in this connection, is something upon which the members of the firm are to be highly complimented.

Thorne Hold-Fast Bar System

Store front construction is something which, owing to economic reasons, requires careful consideration. The unsightly wooden post, cornices, and bulky transom bars now in use have their decided drawback; and even the so-called all-glass construction is claimed to be unsatisfactory, principally because of the high rate of insurance and the fact that dust and water enter the show window through mitred or ground edges, and again because of the great delay in replacing broken glass. For these reasons the metal store front has come to be accepted as the most logical form of construction, and the growing popularity of this type attests to the fact that it has a number of individual advantages. What is regarded as one of the most perfect inventions of this character, is the Thorne Hold-Fast Patent Metal Bars. This system has been designed and made with the object of providing a method for holding the glass firmly together, so as to withstand wind pressure, and still cover the smallest possible surface of the glass, thus assuring a store front with an attractive and finished appearance. This particular construction includes corner, transom, dividing, jam and drip sill bars; and its adoption brings an end to the rotting out of wooden members, besides furnishing a method of setting glass which is water tight, dust proof, and prevents steaming and frosting of show windows. In this country the Thorne Hold-Fast Metal Bar system gives promise of being widely adopted, and already the Hobbs Manufacturing Company, Ltd., who are the Canadian selling agents, have made a large number of installations in various parts of the Dominion. Architects, owners and contractors who may be interested, can secure a complete set of samples and catalogue, with carriage prepaid, by notifying the nearest office of the company—London, Toronto, Montreal or Winnipeg.

Automatic Cement Block Tamper

Catalogue No. 13, the latest advertising effort of the Ideal Concrete Machinery Company, of London, Ont., and South Bend, Indiana, is a very handsome book, 9 x 12 inches in size, which fully describes and illustrates the Ideal Automatic Power Damper and the Ideal Scraper and Finisher Attachment. The illustrations show a number of working views of this equipment used in conjunction with the Ideal Block Machine, and the text is full of interesting and useful facts concerning the practical and economical manufacture of concrete building blocks. Many reasons are advanced in support of the contention that machine tamped blocks are best and to prove that by the use of this particular equipment the manufacturing cost of hollow concrete blocks is reduced at least one-half, while a much better, stronger, waterproof and more saleable block is produced. Any block maker who wishes to improve the quality of his output and increase his profits, will do well to secure and read this interesting catalogue.

In this connection it might be mentioned that the company will have an elaborate exhibit at the Cement Show to be held March 6th to 11th, inclusive, at St. Lawrence Arena, Toronto. The extensive preparations that are being made for this important event are attracting widespread attention, and a large number of visitors from all parts of the continent are expected to be in attendance. To builders, the Ideal Concrete Machinery Company will give special attention, and any one who may be interested in concrete machinery and appliances, together with the recent development of "Tycrete" stone products will be well compensated by paying a visit to this firm's exhibit.

Markets

Prevailing Prices of Builders' Supplies.

February 24, 1911.

CEDAR POSTS

8 feet x 6 inch top		0 30
8 feet x 7 inch top		40
8 feet x 8 inch top		50

CORNICE MATERIAL

⅞ x 2 Crown and Bed Mold,	per 100 ft.	1 25
⅛ x 4 Crown and Bed Mold	per 100 ft.	2 00
⅞ x 6 Crown and Bed Mold	per 100 ft.	3 00
⅞ x 1¼ Cove.	per 100 ft.	1 00

FRAME MATERIAL

⅞ x 4¾ Pulley Stile	per 100 ft.$	1 75
1⅜ x 4¾ Hanging Stile	per 100 ft.	1 25
1¾ x 4 Hanging Stile	per 100 ft.	2 25
1⅜ x 6 Hanging Stile	per 100 ft.	3 50
⅞ x 3¼ Lining.	per 100 ft.	1 10
½ x ⅞ Parting Stop		60
½ x 1⅜ Sash Stop.		85
1¾ x 5¾ White Pine Sash Sill or Door Jamb.		4 00
1¾ x 5¾ Red Pine		3 25
⅞ x 5¾ White Pine Door Jamb No. 1 and No. 2.		2 00,-1 75
3 x 6 White Pine Sub Sill.		6 50
4 x 6 White Pine Sub Sill.		7 50
2 x 6 Oak Sill.	per lineal ft.	09
2 x 8 Oak Sill.	per lineal ft.	12
2 x 10 Oak Sill	per lineal ft.	15

HEMLOCK NO. 1

2 x 4 to 2 x 12 x 10 ft.	per M. ft.	21 00
2 x 4 to 2 x 12 x 12 and 14 ft.	per M. ft.	19 00
2 x 4 to 2 x 12 x 16 ft.	per M. ft.	22 00
2 x 4 to 2 x 12 x 20 ft.	per M. ft.	26 00
4 x 4 to 10 x 10 to 16 ft.	per M. ft.	21 00
1 inch Sidings.		18 00,-19 00
1 x 10 inch and 12 inch Stocks.		22 00

HEMLOCK NO. 2

$4.00 per M. less than No. 1

⅞ x 2 Bond Strip and Strappings.	per 100 ft.	40

Sizing Joist and Scantling, $1.00 per M. extra

Dressing, $1.50 per M. extra.

LATH

No. 1, No. 2, No. 3 White Pine, 4 ft.	$	4 75,-4 25,-3 50
No. 1, No. 2, No. 3 Red Pine		4 25,-3 75,-3 00
M. R. White Pine, 48 inch,-32 inch		4 50,-2 25

PINE, Red

2 x 4, 2 x 6 x 10 to 16 ft.	$	24 00
2 x 4, 2 x 6 x 18 ft.		25 00
2 x 8 x 10 to 14 ft.		26 00
2 x 8 x 16 ft.		25 00
2 x 10 x 10 to 14 ft.		28 00
2 x 12 x 10 to 14 ft.		31 00
4 x 4, 4 x 6, 6 x 6 x 6 x 10 to 16 ft.		28 00
6 x 8, 8 x 8 x 10 to 16 ft.		20 00
1 x 10 inch Box.		28 00
1 x 12 inch Box.		30 00
1 inch Mill Cull Sidings.		21 00
1 inch Mill Cull Stocks		24 00
⅞ x 2 Strapping and Grounds.	per 100 ft.	50
2 x 2 Bridging, cut to lengths for 2 x 8 and 2 x 10 Joist, per 100 pieces		1 75

PINE DRESSED

1 x 6 No. 1 Shelving, D. 2 S.	$	35 00
1 x 8 No. 1 Shelving, D. 2 S.		36 00
1 x 10 No. 1 Shelving, D. 2 S.		40 00
1 x 12 No. 1 Shelving, D. 2 S.		45 00

No. 2 or Sound Common, $5.00 per M. less in each case.

SASH AND FRAME

1⅜,-1¾ inch Sash, 2 or 4 lights, up to 3.0 x 5.6		1 00,-1 10
1⅜,-1¾ inch Sash, 2 or 4 lights, up to 4.0 x 6.0		1 25,-1 45
1¾,-1¾ inch Casements, Cellar or Fanlights, 1 to 3 lights, up to 3.0 x 2.6.		50,-60
Box Frames, up to 3.0 x 6.0.		2 75
Box Frames, up to 4.0 x 6.0.		3 25
Door Frames, 2 x 6 Jambs and 2 x 6 Oak Sill, up to 3.6 x 7.		3 75
Door Frames, with Transom 2 x 6, Jambs 2 x 6, Oak Sill.		5 00
Cellar Frames, 2 x 6, Jambs and Sills.		2 00
Casement Frames, 2 x 6 Jambs and Sills, up to 8 sq. ft.		2 25

SHINGLES

XXX B.C. Cedar,-Ontario Cedar.	per M.$	3 50,-3 35
XX B.C. Cedar,-Ontario Cedar.	per M.	3 35,-2 75

STAIR MATERIAL IN PINE

1⅛ x 10, 1⅜ x 10, treads, nosed, up to 16 ft.,	per lineal ft.$	0.05,- 06
1⅛ x 12, 1⅜ x 12, treads, nosed, up to 16 ft.,	per lineal ft.	07,-08
1⅜ x 10, 1⅜ x 12, strings, D. 4 S., up to 16 ft.,	per lineal ft.	06,-08
⅞ x 7, ⅞ x 8, Risers.	per 100 ft.$	2 50,-2 75
3 x 3, 3 x 4 Hand Rail.	per lineal ft.	07,-08
⅞ x 2¾ String Cap	per lineal ft.	02
1⅜ x 2¾ Nosing and Cove.	per lineal ft.	03
⅜ x 1¾, ⅜ x 2½ String Mold.	per 100 ft.	1 00,-1 25
⅜ x 1⅜ and 1¾ Filling	per 100 ft.	1 25
¼ x ⅞, 1⅜ and 1¾ Filling.	per 100 ft.	1 00
⅜ x ⅞	per 100 ft.	1 00
⅞ x ⅞, ⅞ x 1⅜, ⅞ x 1¾, 1⅜ x 1⅜ Balusters, per hundred.		0 80,-1 00,-1 25,-1 50
4 x 4 Turned Newells, ¼ cut up to 5 ft.		1 00
5 x 5 Turned Newells, ¼ cut up to 5 ft.		1 25
6 x 6 Turned Newells, ¼ cut up to 5 ft.		1 75

STAIR MATERIAL IN HARDWOOD

1⅜ x 10, 1⅜ x 10½ to 12 Birch or Maple, nosed and cut lengths.	per lineal ft. $	16,-20
1⅜ x 10, 1⅜ x 10½ to 12 Oak and Ash, nosed and cut to lengths.	per lineal ft.	22,-25
3 x 4 Oak and Ash Hand Rail, 1 or 2 members	per lineal ft.	15
3 x 4 Birch Hand Rail, 1 or 2 members,	per lineal ft.	12
3 x 4 ¼-Cut Oak Veneered Hand Rail	per lineal ft.	25
⅞ x 2¾ and 3¾ Oak and Ash String Cap,	per lineal ft.	03,-04
⅞ x 1⅜ Oak Baluster, D. 4 S.	per 100 ft.	1 50
⅞ x ⅞ Oak, Ash and Birch Balusters, D. 4 S.,	per 100 ft.	1 00
⅝ x ⅞ Oak and Ash Cove.	per 100 ft.	1 00
5 x 5, 6 x 6 Turned Birch Newells, up to 5 ft.		1 25,-1 75

PINE TRIM—WHITE

⅞ x 4 Casing, Clear, No. 1, No. 2	per 100 ft.$	2 50,-1 80,-1 50
⅞ x 5 Casing, Clear, No. 1, No. 2	per 100 ft.	3 00,-2 15,-1 75
⅞ x 8 Base ,Clear, No. 1, No. 2	per 100 ft.	5 00,-3 25,-2 90
⅞ x 10 Base, Clear, No. 1, No. 2	per 100 ft.	6 50,-4 25,-3 75
⅝ x ⅞ Quarter Round	per 100 ft.	60
⅝ x ⅞ Cove.	per 100 ft.	70
⅞ x 6, ⅞ x 7, ⅞ x 8 Heads, No. 1	per 100 ft.	2 50,-3 00,-3 50
⅜ x ¾ and 1⅛ Neck Mold.	per 100 ft.	80
1⅜ x 1¾, 1⅜ x 2¾, 1¾ x 2½ Hood Mold	per 100 ft.	2 00,-3 00,-3 50
1⅛ x 4, 1⅛ x 5 Base Blocks	per 100 ft.	3 00,-3 50
1⅛ x 3½, 1⅛ x 4½ Window Stool.	per 100 ft.	2 75,-3 25

SPECIFICATIONS

Clear—Bright Sap, no defect.

No. 1—Fine dressing, clear and cut up, sound stained sap, no defect.

No. 2—Common Dressing.

Clear face Norway, priced same as No. 1

Dressing Norway, priced same as No. 2.

ROOFING

⅞ Roofing (sound knotted common pine)	per M. ft.$	30 00
⅞ Roofing, Red Pine, Spruce.	per M. ft.	24 00,-25 00
⅞ Roofing, Spruce, No. 3 and M. C. Pine	per M. ft.	22 00
⅞ Roofing, Hemlock.	per M. ft.	21 00

FLOORING

1⅛ Pine flooring, face strip measure.	per M. ft.$	45 00
⅞ x 4 and 5 inch, No. 1, No. 2.	per M. ft.	30 00,-27 00
⅞ x 4 and 5 inch, No. 1, No. 2 Red Pine.	per M. ft.	28 00,-25 00
⅞ x 2½ and 3½ Georgia Pine, B. and Better	per M. ft.	45 00

SHEETING

⅞ x 4 to 6, No. 1 and No. 2, V. and B. Pine	per M. ft.	35 00,-27 00
⅞ x 4 to 6, V. and B. Spruce.	per M. ft.	27 00
⅞ x 2 to 3½ V. and B. Georgia Pine, B. and Better	per M. ft.	45 00
⅜ x 2½ to 3½ V. and B., Pine, Face strip measure	per M. ft.	25 00
⅜ x 2½ to 3½ V. and B., Georgia Pine, Face strip measure	per M. ft.	28 00

SIDING

⅞, No. 1 and No. 2, Pine, Man.	per M. ft.$	35 00,-27 00
⅞, Spruce and Red Pine, Man.	per M. ft.	27 00
No. 1 and No. 2 Feather Edge.	per M. ft.	28 00,-22 00

VERANDAH MATERIAL

3 x 6 Top rail,	per lineal ft. $	0 10
3 x 5 Top rail,	per lineal ft.	09
3 x 4 Top rail,	per lineal ft.	06
2 x 6 Bottom rail,	per lineal ft.	05
2 x 5 Bottom rail,	per lineal ft.	04½
2 x 4 Bottom rail,	per lineal ft.	03
5-16 x 1⅜ Lattice Work,	per 100 ft.	60
5-16 x 1¾ Lattice Work,	per 100 ft.	75
⅞ x 1⅜ Balusters, D. 4 S.,	per 100 ft.	1 00
⅞ x 1¾ Balusters, D. 4 S.,	per 100 ft.	1 10
2¾ x 2¾ Balusters, turned up to 2 ft.		15
3¾ x 3¾ Balusters, turned up to 2 ft.		25
1⅛ Bandsawn Balusters, finished, each.		08
1⅜ Bandsawn Balusters, finished, each		09
1¾ Bandsawn Balusters, finished, each		12
5 x 5 Newells, turned tops, ¼ cut, up to 3.6 long, each		1 00
6 x 6 Newells, turned tops, ¼ cut, up to 3.6 long, each		1 25
5 x 5 Newells, turned tops, hearts in, up to 3.6 long, each		75
6 x 6 Newells, turned tops, hearts in, up to 3.6 long, each		90

	Toronto	Winnipeg	Montreal
CEMENT			
Bbl. lots in bags	$ 1 90	$ 2 00,-2 35	$ 1 85
Car lots F. O. B. Car	1 65	1 55	1 35,-1 40
1000 Bbl. lots	1 55		
Bags 40 cts. extra, refunded on the return of bags			
Small lots 10 cts. to 15 cts. extra for delivery on job			
BRICK			
Per M.			
No. 1 Dry Red Pressed	17 00	33 00	21 00
No. 2 Dry Red Pressed	14 00		19 00
No. 1 Dry Buff Pressed	18 00	45 00	22 00
No. 2 Dry Buff Pressed			20 00
American Pressed			32 00-35 00
Red Stock, Inside	9 50		
Red Stock, Facing	12 00	23 00	
Grey or White Stock, Inside	9 50	11 00	
Grey or White Stock, Facing	11 00		17 00
Wire Cut for Foundations	11 00	45 00	
Porous Terra Cotta	30 00,-35 00	45 00	
Scotch and English Fire			
American Fire	28 00,-33 00		
No. 1 Enamelled		100 00	
LIME, PLASTER, ETC.			
Lime, Del. per cwt	0 38		0 40
Lime, Del. per car lot, per ton, F.O.B. Cars	7 60		8 00
Hydrated Lime, per ton, Del.	10 60	12 00	13 00
Hard Wall Plaster, Sanded	4 50	12 50	4 75
Hard Wall Plaster, Unsanded	8 50		13 75
Plaster of Paris, per Bbl. of 300 lbs.	2 15	3 10	2 00
Steel Channels, per 100	2 75,-3 00		
Expanded Metal, 10 gauge, per 100 ft.	3 50		
BUILDING AND ROOFING SUPPLIES			
Tar Paper, 7-oz., 10-oz., 16-oz., per cwt.	1 60,-1 80		1 80
Tar Sheathing, per roll of 400 sq. ft		0 88	0 55
Dry Sheathing, No. 1 per roll of 400 sq. ft			45
Tar Fibre (or Dry No. 1), No. 2, per roll of 400 sq. ft.	40	72	45
Dry Fiber No 2, per roll of 400 sq. ft.	30		28
Ready Roofing, 2 ply, per roll of 100 sq. ft.	70	2 00	70
Ready Roofing, 3 ply, per roll of 100 sq. ft.	95	2 50	95
Roofing Tin Caps, per cwt.	7 00	7 00	7 00
Roofing Wire Nails per cwt	6 00	4 15	6 00
Roofing Cement in Bbls, 40 gals.			6 00
Roofing Cement small lots per gal.			20
Roofing Cement Bbls., per cwt.		3 25	
Coal Tar, per Bbl., 40 gals	3 50	5 00	4 00
Roofing Pitch, No. 1, per 100 lbs.	70	1 00	75
Roofing Pitch, No. 2, per 100 lbs.	60		60
ROOFING SLATES			
No. 1 Canadian 10 x 16 in., per square, F.O.B. Cars	$ 7 00		
Mottled Unfading 10 x 16 in., per square F.O.B. Cars	7 75		
Green Unfading 10 x 16 in., per square F.O.B. Cars	7 75		8 00,-10 00
Red Unfading 10 x 16 in. per square F.O.B. Cars	18 00		

SEWER PIPE

		Toronto	Winnipeg	Montreal
Straight per ft.	4 inch	$ 0 07	$ 10½	07
	6 inch	10½	16½	10
	9 inch	21	29	21
Single Junction	4 inch		50	
	6 inch		70	
	9 inch		1 20	
Double Junction	4 inch		60	
	6 inch		1 00	
	9 inch		2 00	
Increasers and Reducers	6 inch		50	54
	9 inch		1 00	84
P. & H. H. Traps	6 inch		1 63	
	9 inch		3 25	
Bends	4 inch		35	23
	6 inch		50	38
	9 inch		1 05	84
Weeping Tile	2½ inch	01		
	3 inch	02		
	4 inch	03		

These prices are net, being 65% off list price. Car lots, 73% off.

	Toronto	Winnipeg	Montreal
STONE			
Crushed, F.O.B. Cars, per ton	$ 1 30,-1 35		$ 90,-1 00
Binder, F.O.B Cars, per ton	1 40		1 50
Rubble, F.O.B. Cars, per ton	1 25,-1 30		50
Rubble, F.O.B. Cars, per toise	14 00,-15 00		
Brown Coursing, per yd., Del.	3 25,-3 50		
Grey Coursing, per yd., Del.	2 25,-2 50		
Brown Sills and Beads, in the rough, per ft., Del.	35		

WINDOW GLASS

UNITED INCHES

	Toronto Star	Toronto D.D.	Winnipeg Star	Winnipeg D.D.	Montreal Star	Montreal D.D.
10 to 25 per 100 ft. Box	$ 2 68	3 94			$ 2 81	3 74
26 to 40 per 100 ft. Box	2 93	4 26		5 50	3 02	4 04
41 to 50 per 100 ft. Box	3 21	4 73		6 50	3 53	4 72
51 to 60 per 100 ft. Box	3 38	5 36		7 50	3 74	5 10
61 to 70 per 100 ft. Box	3 63	6 15		8 50	4 00	5 53
71 to 80 per 100 ft. Box	3 94	6 93		9 50	4 42	5 95
81 to 85 per 100 ft. Box	4 41	7 88		10 50	5 02	6 67
86 to 90 per 100 ft. Box		9 45		11 50		7 74
91 to 95 per 100 ft. Box		11 03		13 50		8 42
96 to 100 per 100 ft. Box		12 92		16 00		9 35
101 to 105 per 100 ft. Box		15 12		18 50		
106 to 110 per 100 ft. Box		17 33		21 00		

	Toronto	Winnipeg	Montreal
PUTTY			
Bulk, in casks, per cwt	$ 3 00	2 90	
Bladders, in Bbls., per 100 lbs.	2 25,-2 50	3 15	2 00
Bladders, in 100 lb. cases	2 75	3 40	

It is our intention, as soon as arrangements can be made, to also include in this page the markets of Halifax, Regina, Edmonton and Vancouver. We want to make The Builder and Contractor truly national in its field. The markets will be greatly enlarged in April 1st issue.

Mr. Builder!

Do you know that *Modern Gas Lighting* is fast becoming popular for home use. People are beginning to realize the new place that gas lighting is vastly different than the one-time article. The new question is—

How about that House Piping?

If a home contains gas-light piping in every room, as well as electric wiring—enabling the owner or tenant to choose which one he will use—makes a better selling, and more ready renting hime than if only one or the other is used. Combination gas and electric fixtures are—the ideal.

Our consulting department is at your service free.

The Consumers' Gas Company of Toronto

Architects' and Builders' Dep't—Room 2, 17 Toronto Street.

Phone M. 3790

Your Catalogue Represents You

Did you ever look at it that way?

When seeking trade you do not send a slovenly representative, a man of poor address and careless habits.

Then why should you not be as careful of the appearance of your catalogue?

Your catalogue is your representative, oftimes your only representative, for it reaches many your travellers are unable to touch. It speaks of you and you are judged by it.

The catalogues that are daily coming off our presses are works of art. The originality of the cover designs attracts and the neatness of type arrangement makes easy and pleasant reading.

Give us the printing of your catalogue and we will give you a representative that will bring favorable judgment upon you.

ACTON PUBLISHING CO. LIMITED

59-61 JOHN STREET - - TORONTO, ONTARIO

Our Information Department

[illegible] Is at the disposal of all

Builders and Contractors

Who wish to puchrase.

No matter what you want to buy—Machinery, Tools, Building Materials and Supplies—we can place you directly in communication with reliable manufacturers and dealers in those lines.

Drop Us A Post Card

Immediately on the receipt of a request from any of our subscribers for information, we shall forward his name to the interested manufacturers and dealers, who will furnish him with just what he wants and at the right price.

Manufacturers

who have not yet their catalogues filed in our office will benefit themselves and our subscribers by sending us copies of the same.

The Builder and Contractor

Acton Publishing Co., Limited
59-61 John Street - Toronto, Canada